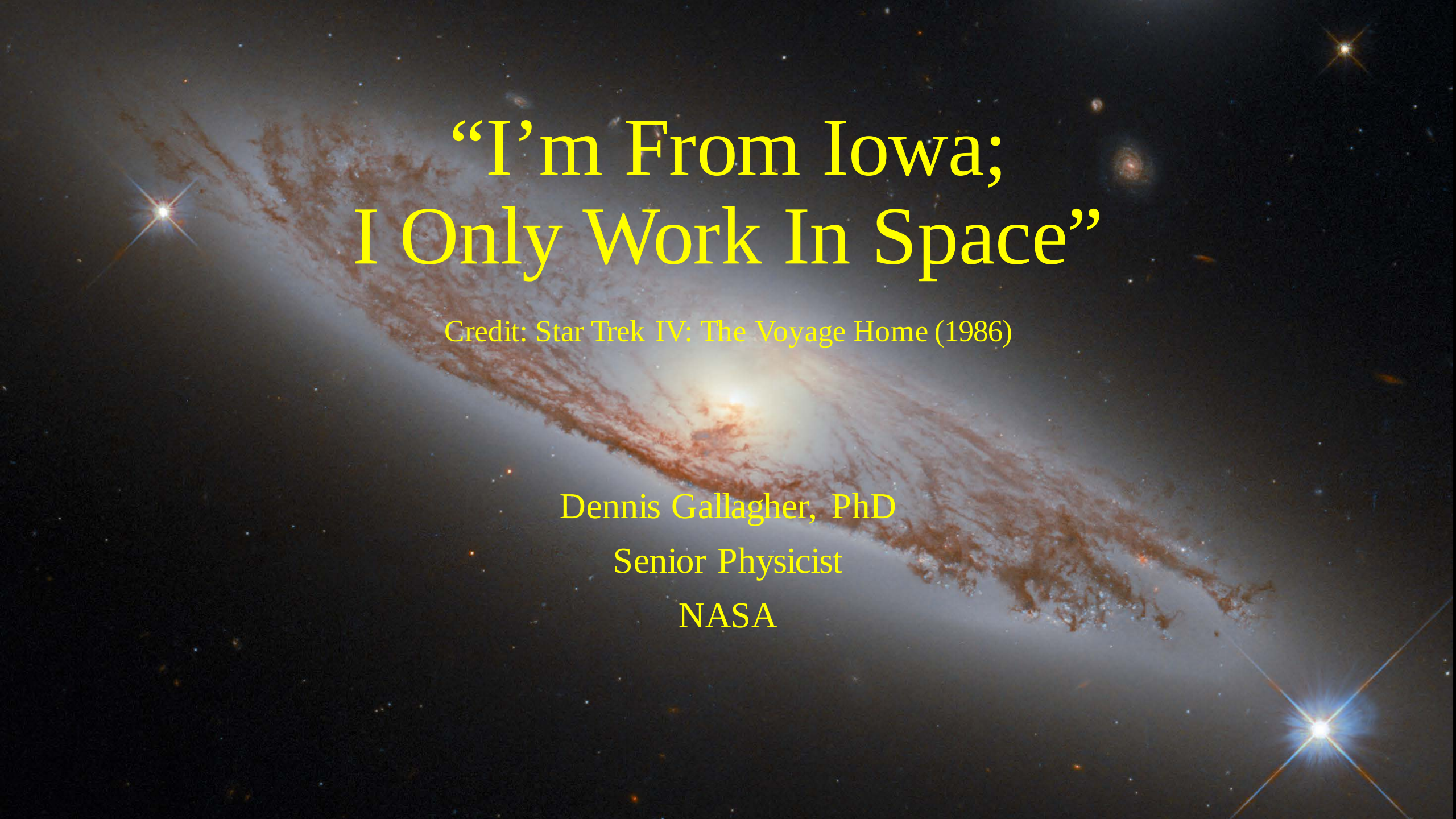


“I’m From Iowa; I Only Work In Space”

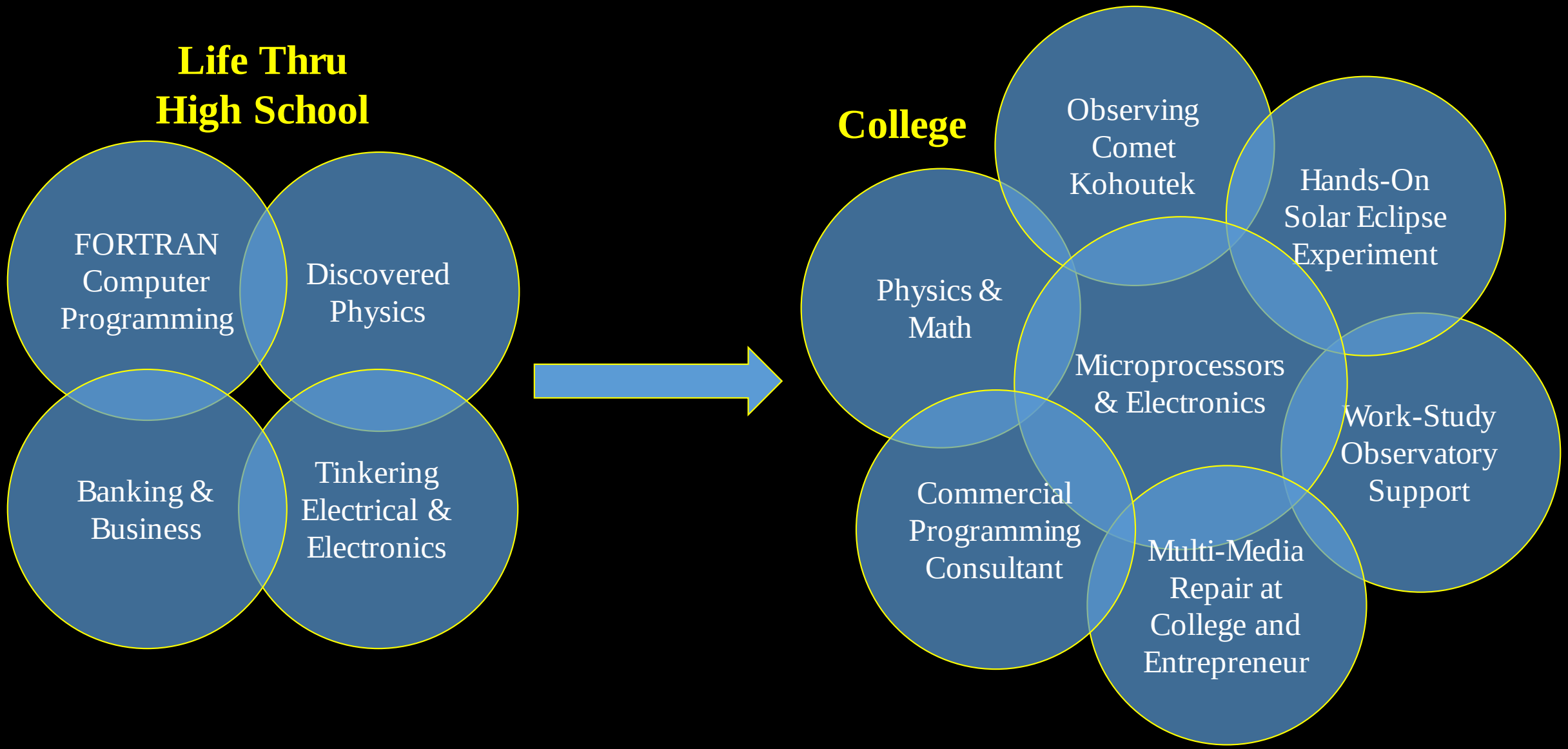
Credit: Star Trek IV: The Voyage Home (1986)

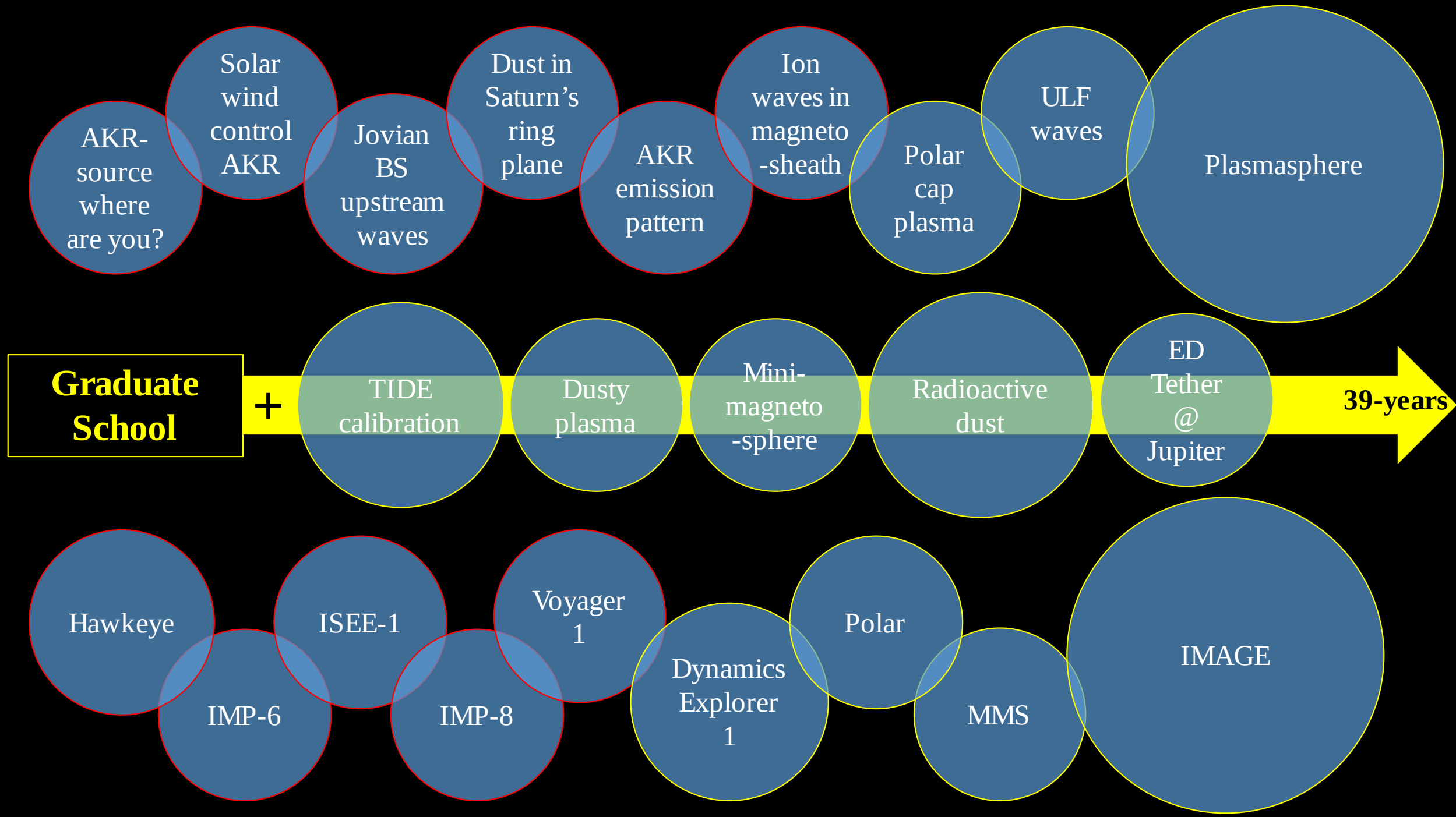
Dennis Gallagher, PhD

Senior Physicist

NASA

Part Nature & Part Nurture

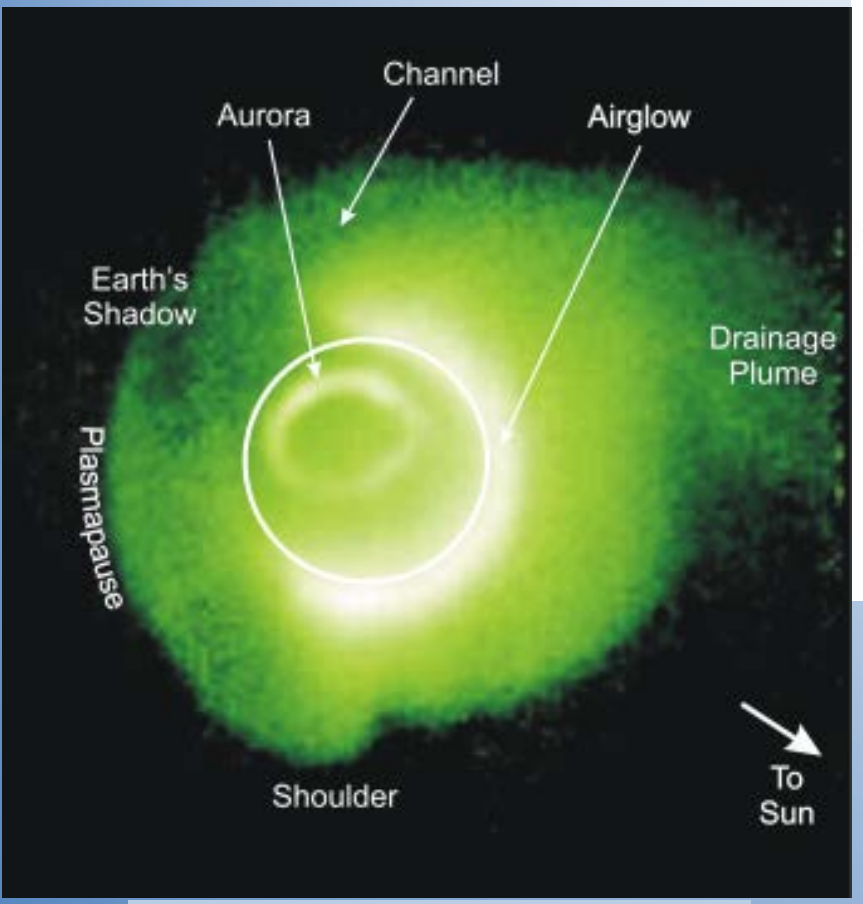



AKR-source where are you?
Solar wind control AKR
Jovian BS upstream waves
Dust in Saturn's ring plane
AKR emission pattern
Ion waves in magneto-sheath
Polar cap plasma
ULF waves
Plasmasphere
Graduate School
+
TIDE calibration
Dusty plasma
Mini-magneto-sphere
Radioactive dust
ED Tether @ Jupiter
39-years
Hawkeye
IMP-6
ISEE-1
IMP-8
Voyager 1
Dynamics Explorer 1
Polar
MMS
IMAGE

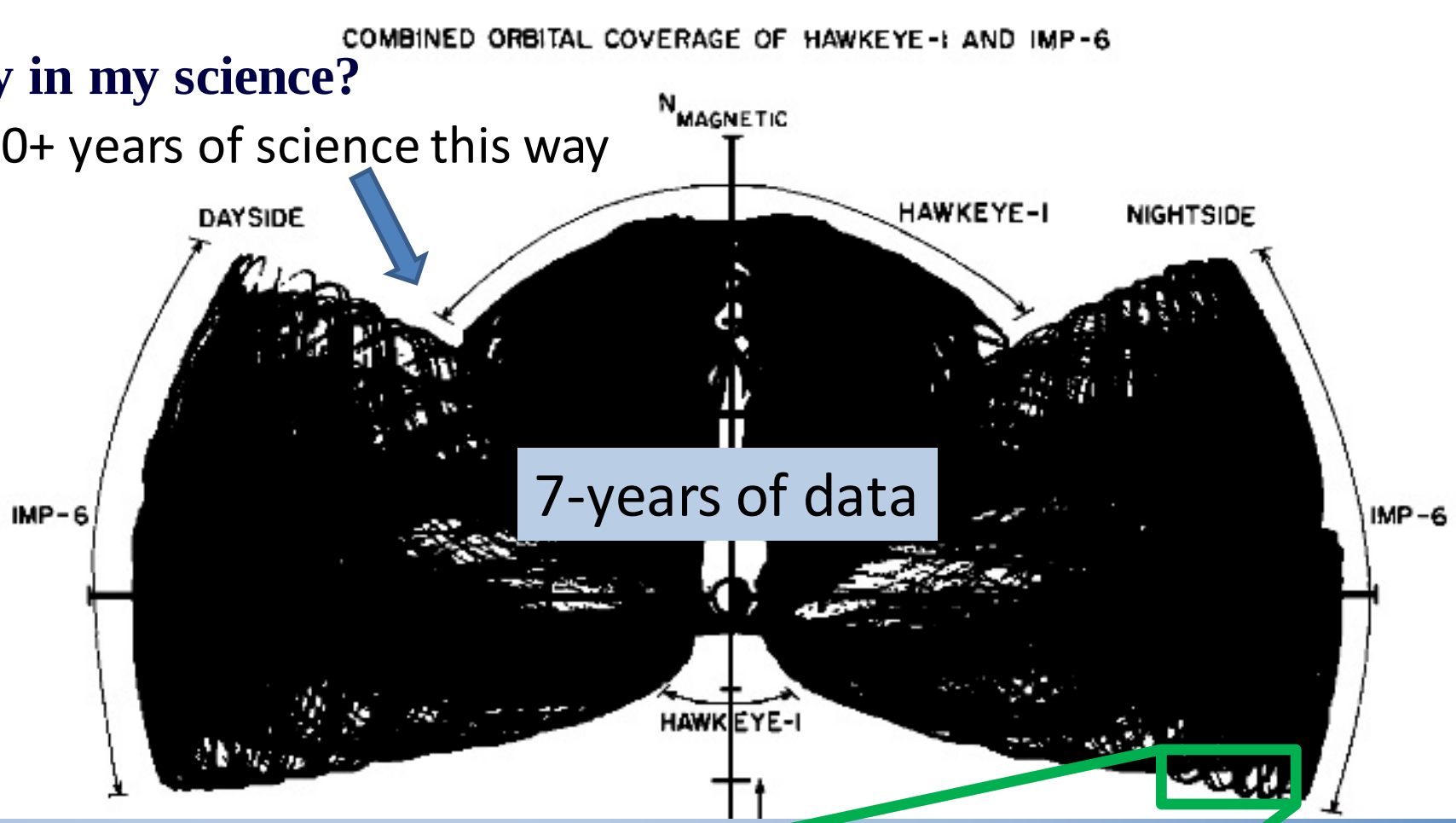
What am I excited about today in my science?

60+ years of science this way

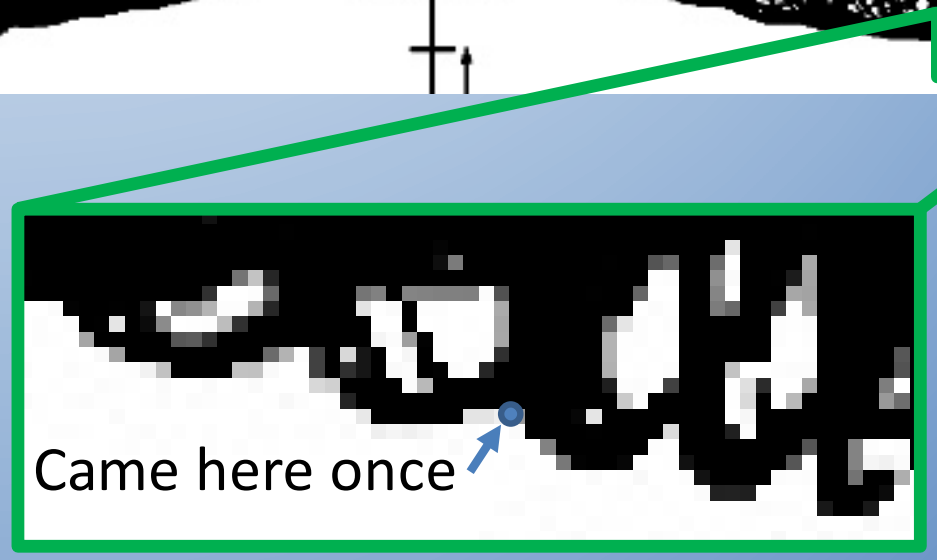
Just a pretty face?



10-Minutes of data



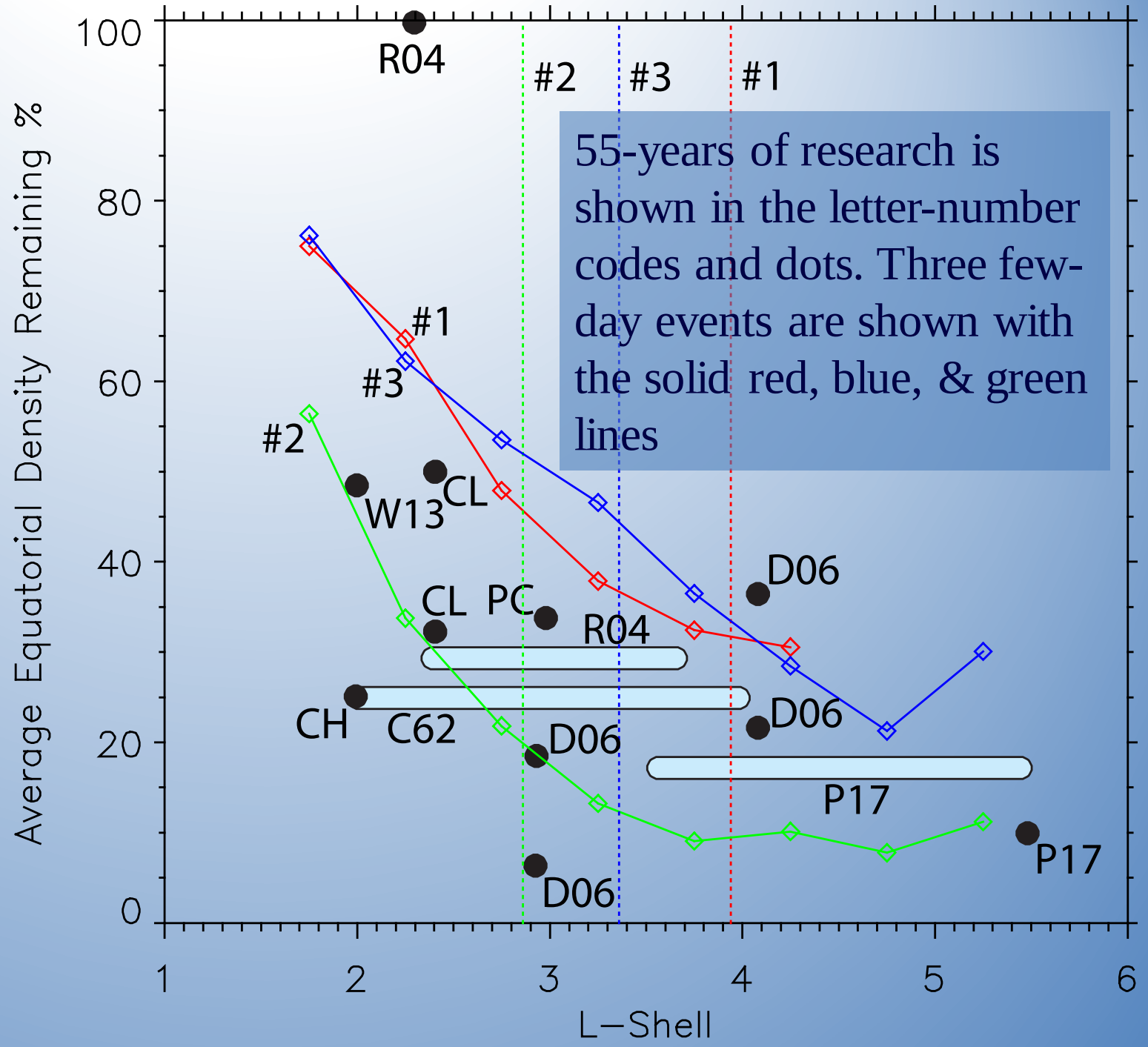
7-years of data



What can following-the-mass from an image accomplish?

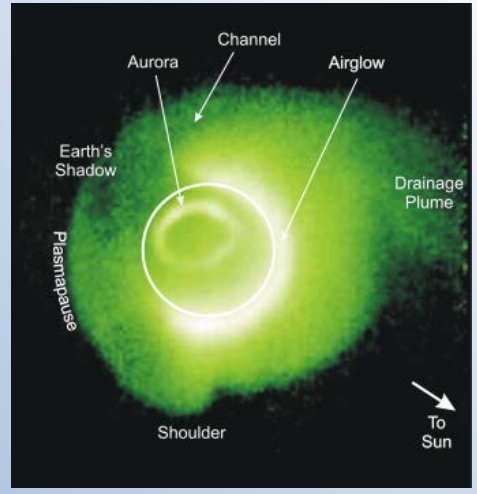
- The average equatorial density remaining in each integration volume versus L-value and compared to previous results.
- These new results are comparable.
- Note that previous results are mostly limited to one location in parameter space.
- **These results provide a more system-level result, yet are limited to only 3-events.**

PC: Park-73/Carpenter-95
CL: Clilverd-00
W13: Wang et al-13
R04: Reinisch et al-04
C62: Carpenter-62
CH: Chi et al-01
D06: Dent et al-06
P17: Piersanti et al-17



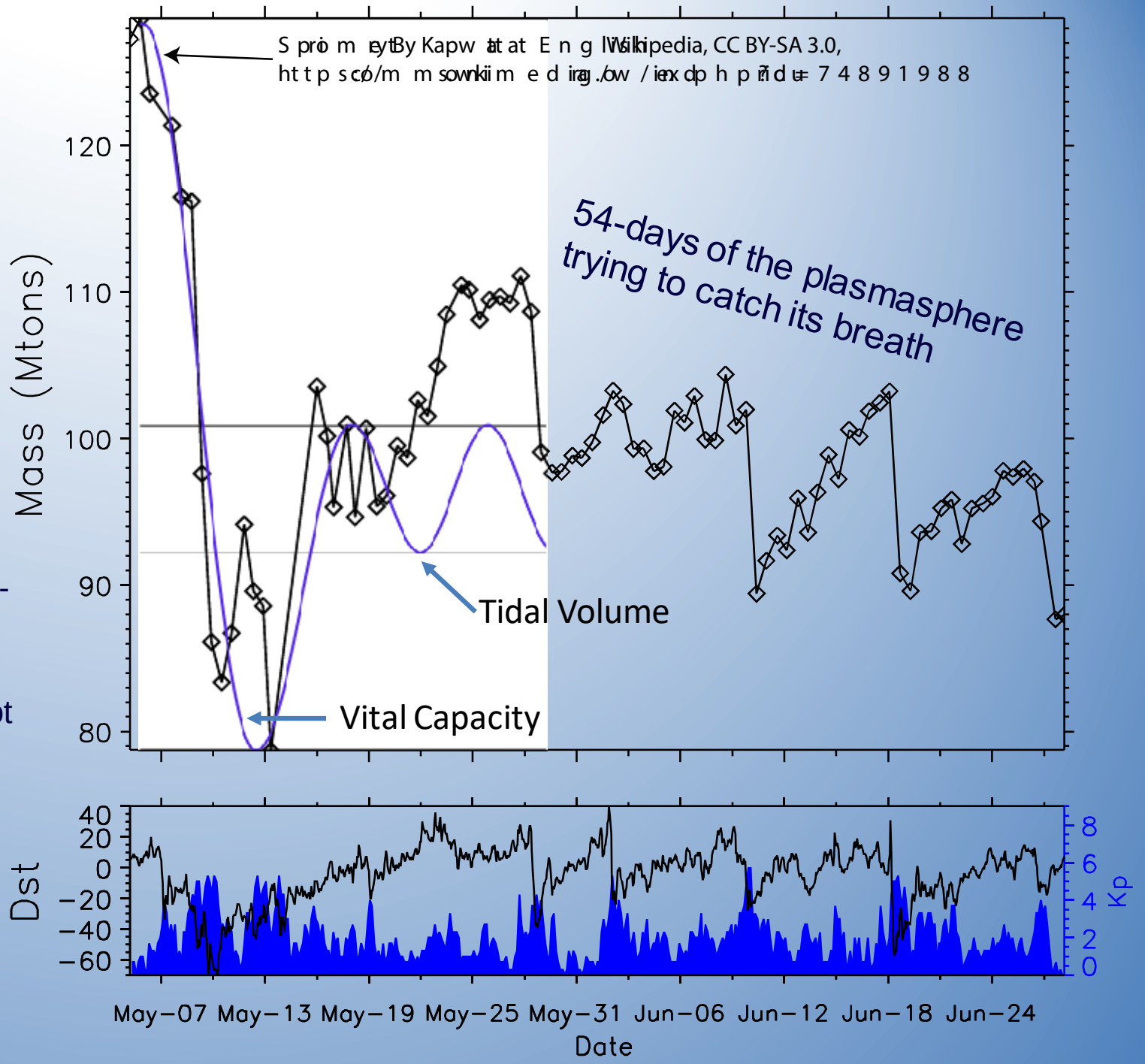
The Breathing Plasmasphere

Gallagher, D. L., Comfort, R. H., Katus, R. M., Sandel, B. R., Fung, S. F., & Adrian, M. L. (2021). The breathing plasmasphere: Erosion and refilling. Journal of Geophysical Research: Space Physics, 126, e2020jA028727. https://doi.org/10.1029/2020/jA028727



Summary of Results

- The use of images is capable of providing system-level quantitative measures of plasmasphere dynamics.
- The eroded plasmapause location is confirmed not to be a boundary for plasma loss or yet shown to suggest a boundary in the effectiveness of loss processes.
- The study of integrated plasma content, such as mass, is a new method of analysis that offers previously difficult or impossible to obtain measures of plasma transport through the magnetospheric system.



And this all means what?

- Actively look for what you want to do in life
- Follow what interests you
- Explore new things, again and again
- Do not expect to know what you want and do not expect it to find you
- Whatever you do, never stop learning
- Finish what you start and do it as well as you possibly can
- Everything you learn has value even if you don’t see it at the time
- Have a plan B and C and D and however many it takes
- Take time to think, be aware, breath, chill, clear your mind, restore your equilibrium; recognize and restrain stress. These investments in your wellbeing will return more than you can imagine.