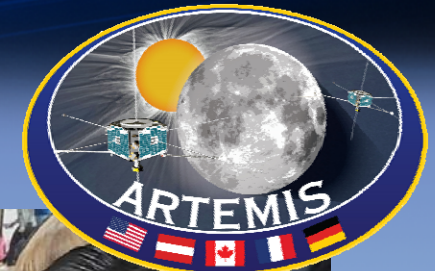


THEMIS-ARTEMIS Education & Public Outreach

Post-AGU SWT Meeting 2019

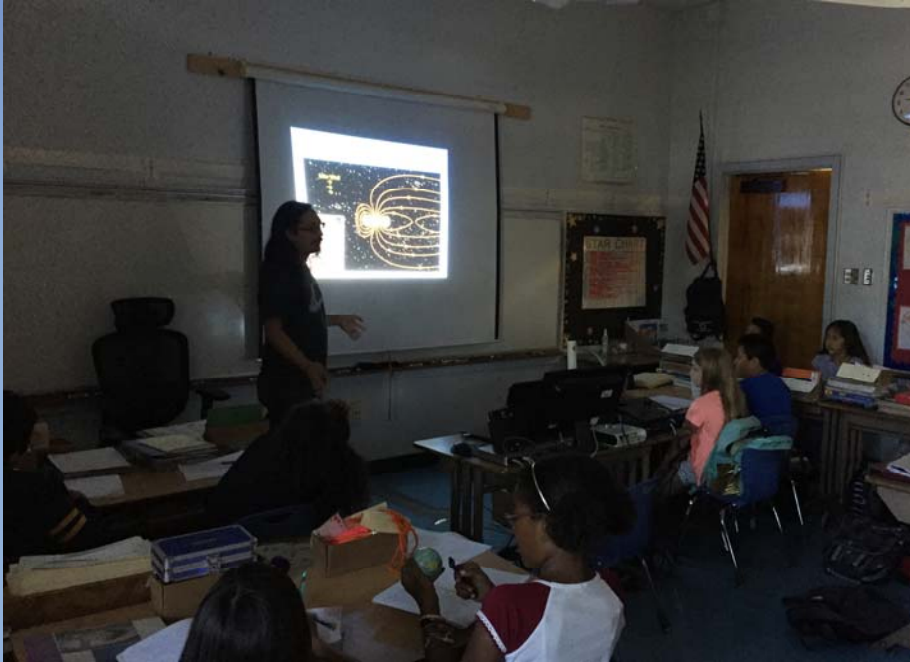


Emmanuel Masongsong – UCLA Earth, Planetary, and Space Sciences

Vassilis Angelopoulos, Fekireselassie Beyene, Andrei Runov, Colin Wilkins, Michael Hartinger

K-12+ School Visits

Serrania Charter for Enriched Studies, 4th grade



My class and I learned a lot about solar flares and why we get auroras...I really enjoyed your time here because it taught me facts I never knew before.

I did not know how auroras were formed or how ginormous sunspots were!

Sunspots are like pimples on the sun that are colder and filled with magnetism

I learned how Earth's magnetic field protects us like a shield against the sun's plasma energy, thank you for teaching me all these mind-blowing topics!

K-12+ School Visits



Toluca Lake Elementary Title 1 5-6th grades

I enjoyed learning about science and space because it teaches people about the environment around the Earth and the dangers that come with it.

Learning about space is critical and relevant because we need to be prepared if anything atrocious happens with space weather.

Although some people say that space isn't important, they are probably uneducated about space weather, magnetic fields, and the aurora borealis. I hope one day a young scientist like me can work on finding more about this puzzling place, space.



NASA International Observe the Moon Night

>700 visitors, age 2 to 92

Oct. 5th at UCLA: Space weather at the moon!

ARTEMIS as a radiation monitor

1972 Solar Storm between Apollo 16/17

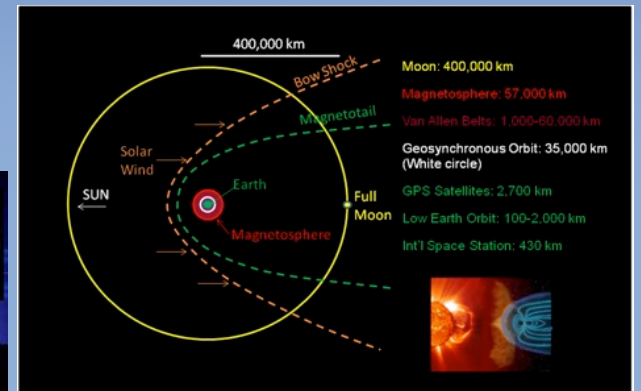
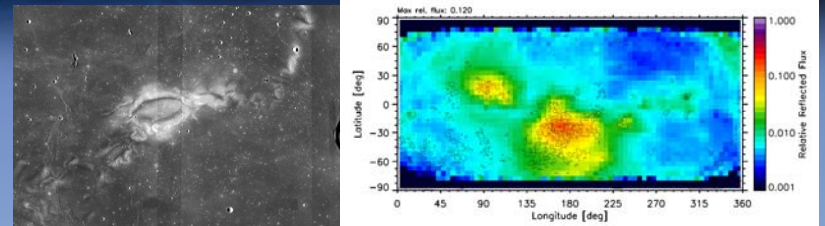
How did Apollo survive the radiation belts?

Regolith weathering/H₂O by solar wind

Lunar wake

Magnetic anomalies

Comparative size of Jupiter m'sphere



CicLAvia ~1000 cyclists reached

- Oct. 6, 2019:
Sponsored by UCLA Centennial
- Over 15,000 attendees
 - solar telescope
 - magnetic field viewers
 - Lenz's law
 - magnaprobe and Earth globe
 - solar magnetic motor
 - ELFIN CubeSat



YOMO LA STEM Festival

~3000 students reached

Oct. 24-26, 2019:

Sponsored by mobile technology companies, LAUSD, Mayor's Office, LA Dept. of Education, Hello Future, STEM Girls, at LA Convention Center
Largest science outreach event in Los Angeles

K-12 and community colleges, over 17,000 attendees over three days! Highly diverse, mostly Latinx kids. We're invited again next year! YOMOLA.com

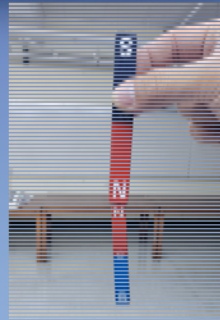


11th Annual Exploring Your Universe at UCLA

>700 visitors reached

All Physical Sciences depts.
hands-on STEM fair, >7000

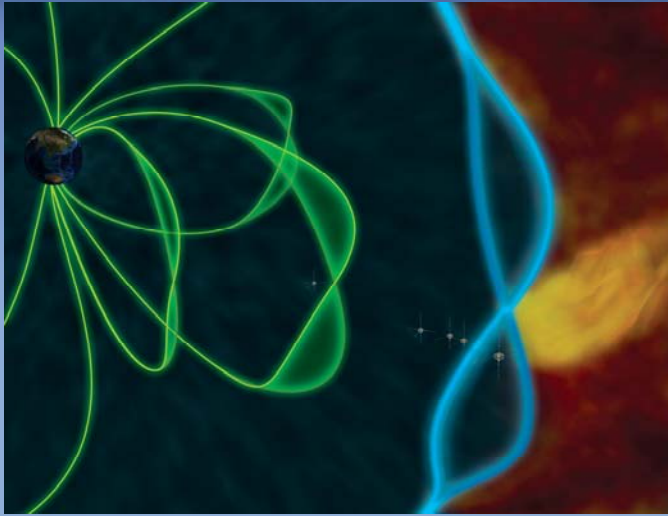
Heliophysics and Space Weather:
Explaining the Invisible!
presented by UCLA EPSS and AOS,
from ELFIN to THEMIS-ARTEMIS and PSP



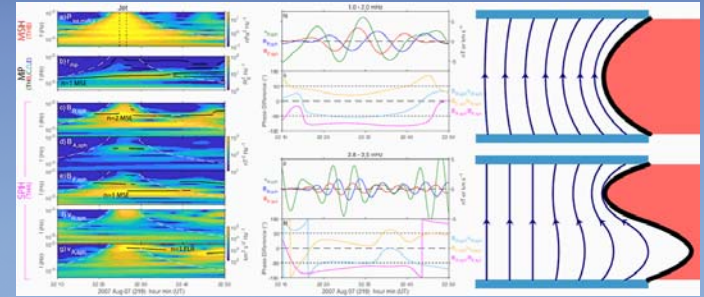
about the Sun-Earth environment

Press Releases & Other Media

tinyurl.com/heliopress

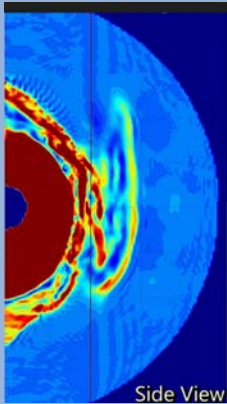


SCIENTIFIC AMERICAN



February 2019: M. O. Archer et al., Nature Comm., NASA News
“Earth's Magnetic Field is the World's Biggest Drum”

<https://www.nasa.gov/feature/goddard/2019/in-solar-system-s-symphony-earth-s-magnetic-field-drops-the->
<https://www.scientificamerican.com/podcast/episode/solar-jets-cause-standing-waves-in-earths-magnetic-field/>

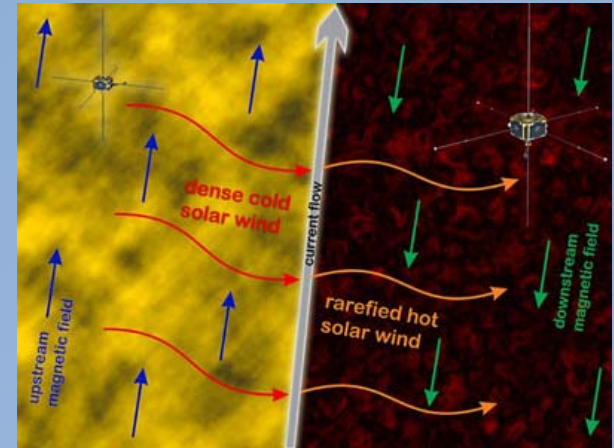


August 2019: T.Z. Liu et al., Science Adv.
 Spaceweather.com
“A New Source of Space Radiation”

<https://spaceweatherarchive.com/2019/08/09/a-new-source-of-space-radiation/>

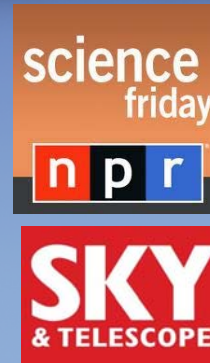
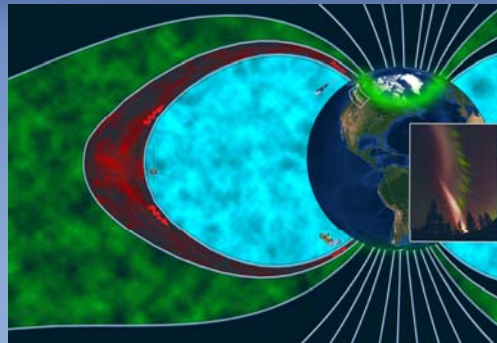
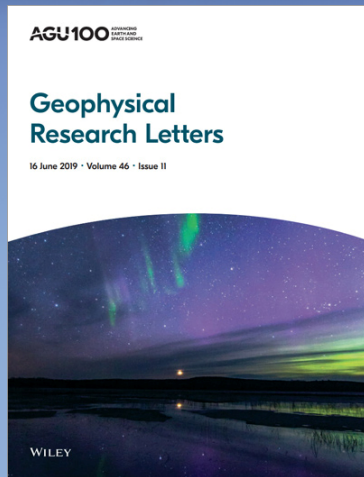
EOS

August 2019: A.V. Artemyev et al., Eos Research Highlight
“Understanding the turbulent nature of the solar wind”
<https://eos.org/research-spotlights/understanding-the-turbulent-nature-of-the-solar-wind>



Press Releases & Other Media

tinyurl.com/heliopress



March 2019: B. Gallardo-Lacourt et al., Eos Research Highlight
“Probing the origin of a new celestial phenomenon”

<https://eos.org/research-spotlights/probing-the-origin-of-a-new-celestial-phenomenon>

June 2019: Nishimura et al., GRL Cover, Eos Research Highlight
“Scientists discover what powers celestial phenomenon STEVE”

<https://news.agu.org/press-release/scientists-discover-what-powers-celestial-phenomenon-steve/>

Aug. 2019: N. Sivadas et al.,
GRL Cover, Eos Research Highlight,
NASA News
“Streaks in Aurora Found to Map
Features in Earth’s Radiation
Environment”

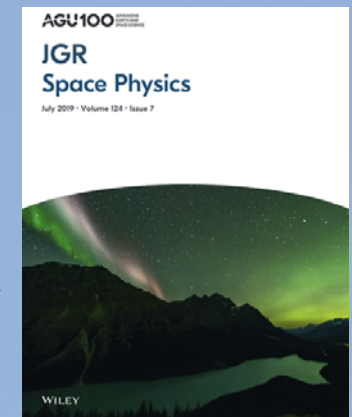
<https://www.nasa.gov/feature/goddard/2019/streaks-in-aurora-found-to-map-features-in-earth-s-radiation-environment>



EOS

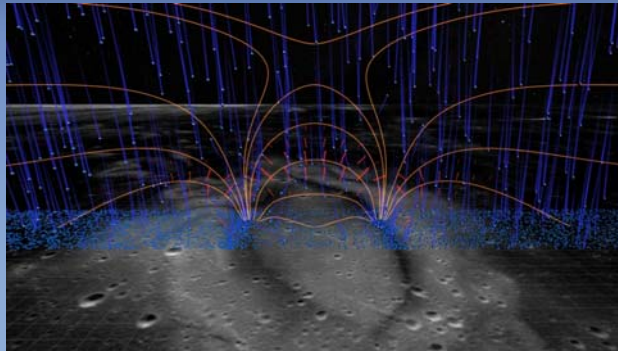
July 2019: S.B. Mende et al.,
JGR Space Physics cover
“Color ratios of subauroral
(STEVE) arcs”

<https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2019JA026851>



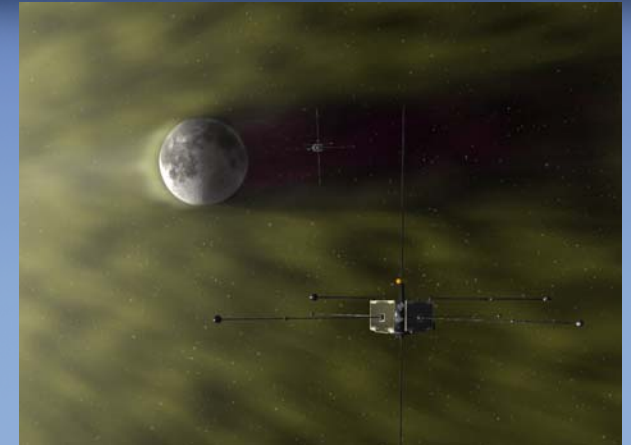
Press Releases & Other Media

tinyurl.com/heliopress



Oct. 2019: NASA News
“Artemis, meet ARTEMIS:
Pursuing Sun Science at
the Moon”

<https://www.nasa.gov/feature/goddard/2019/artemis-meet-artemis-pursuing-sun-science-at-the-moon>

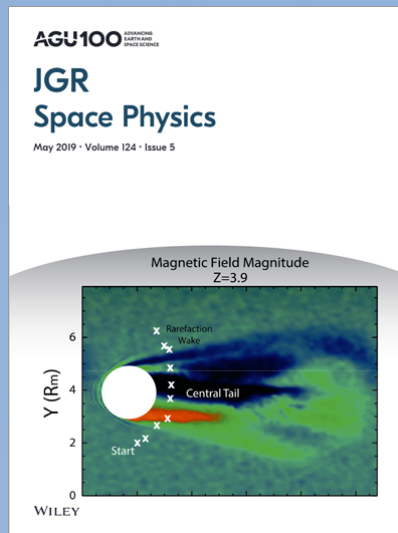


Feb 2019: A.R. Poppe et al., NASA News
“NASA Mission Reveals Origins of Moon's 'Sunburn'”
<https://www.nasa.gov/feature/goddard/2019/nasa-mission-reveals-origins-of-moons-sunburn>

NASA Calendar (August 2020)

May 2019: N. Omidi et al., JGR Cover
“The dominant role of energetic
ions in solar wind interaction
with the moon”

<https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2018JA026243>



May 2019: Astronomy.com

“The NASA robots scouting out the Moon”

<https://astronomy.com/news/2019/05/the-nasa-robots-scouting-out-the-moon>

The image features the host of the game show Jeopardy!, a man with grey hair wearing a dark suit, white shirt, and a striped tie. He is standing on the left side of the frame with his hands clasped in front of him. The background is a stylized blue and orange space-themed backdrop with starburst patterns. The word "JEOPARDY!" is written in large, 3D gold letters across the top right. Below the title is a blue rectangular box with a white border containing text.

JEOPARDY!

**NASA'S THEMIS
PROJECT IS DEDICATED
TO STUDYING
THIS DISPLAY IN
THE ARCTIC CAUSED BY
CHARGED PARTICLES IN
THE MAGNETOSPHERE**

Press Releases & Other Media

youtube.com/nasathemis



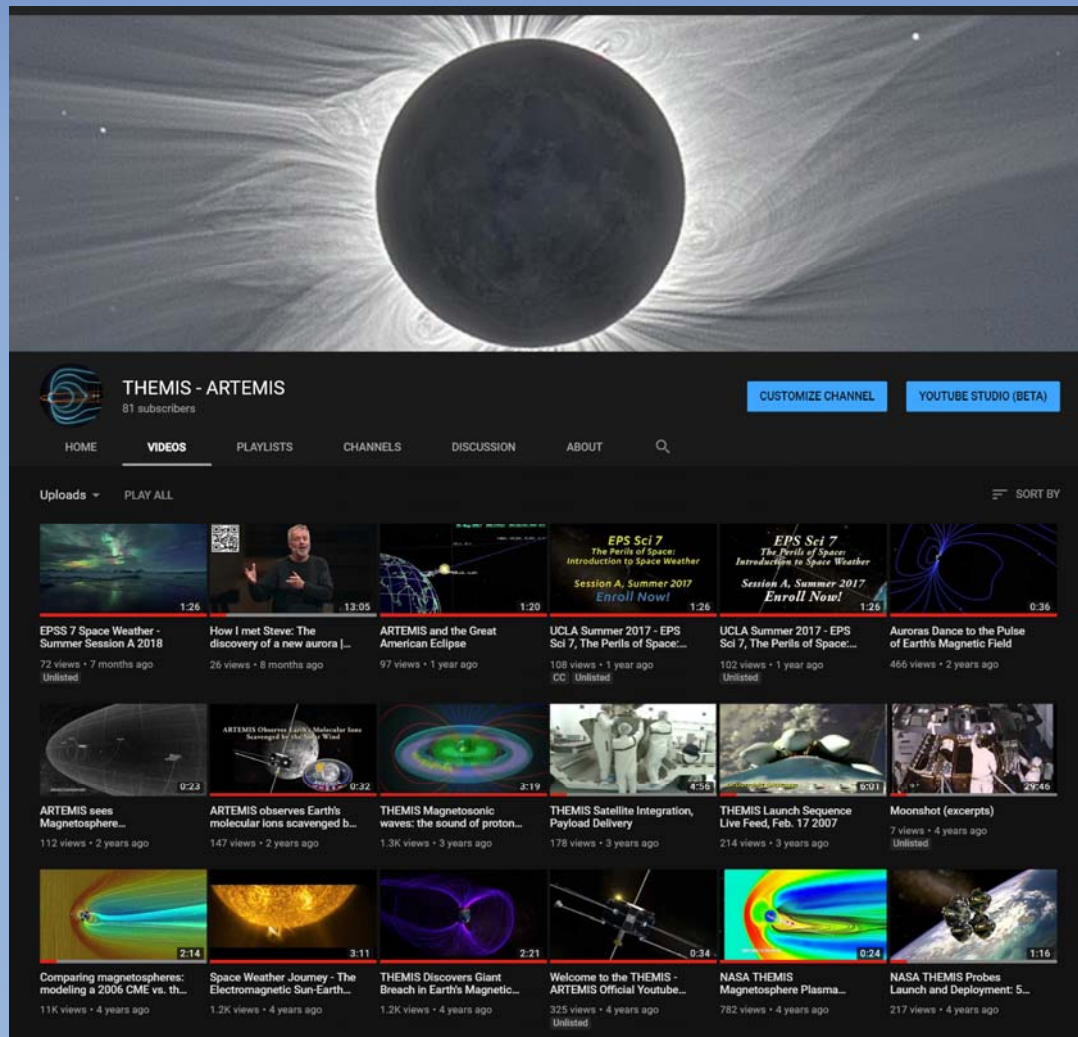
28000 video views
since Jan. 2014
Over 540 hours!!

3000 views in 2019:
43 hours

Please contact me if I
can help edit/annotate
your data, animations,
or demonstrations.

We want to share your
videos!!!!

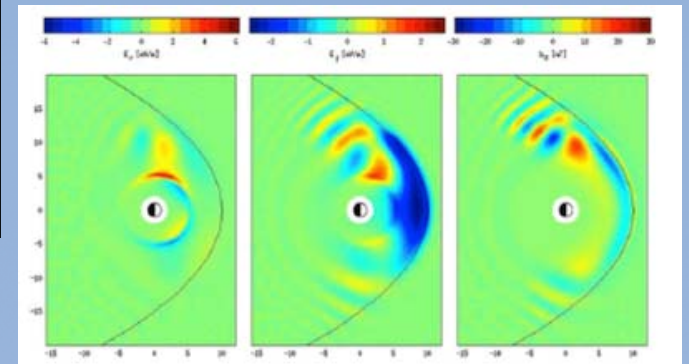
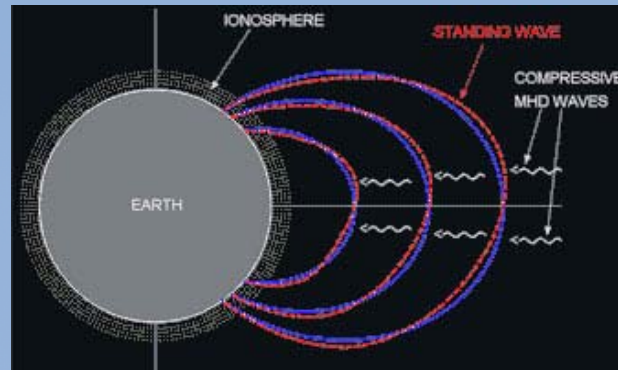
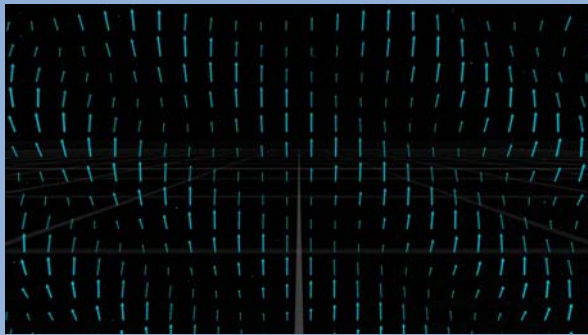
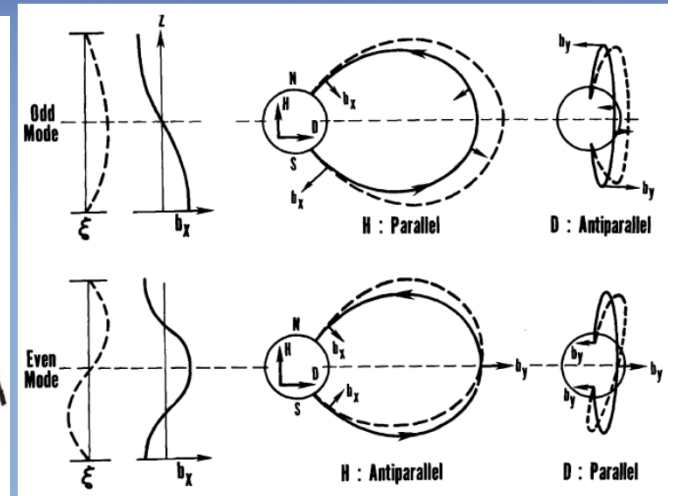
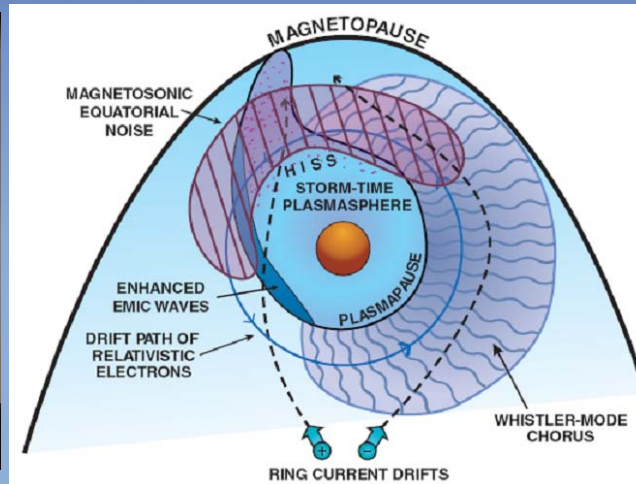
emasongsong@igpp.ucla.edu



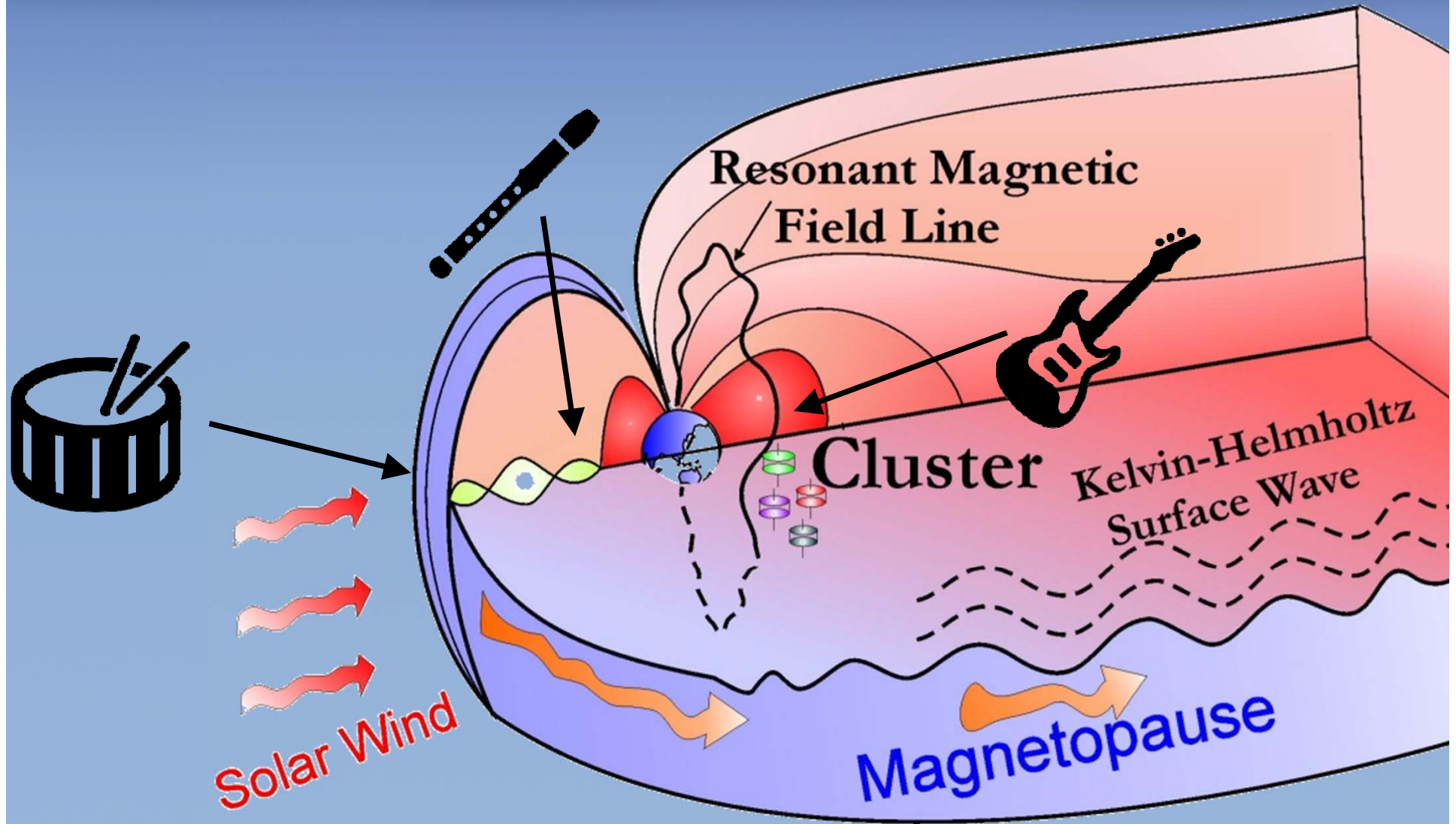
Future Plans... Audification/Sonification!



NASA Citizen Science Mtg



Cosmic guitar strings and magnetic drums

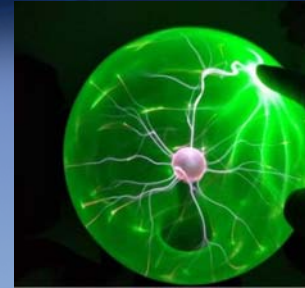


Space Weather Demonstration Models

8" Green and 6" Blue Plasma balls \$30

<https://www.amazon.com/dp/Bo79JWZ6TN/>

<https://www.amazon.com/Pellddy-Sensitive-Plasma-Crystal-6Inches/dp/Bo79KiC4GB>



Magnetic Lines of Force Demonstrator Kit \$36

<https://www.sci-supply.com/Magnetic-Line-of-Force-Demonstrator-p/ss2445-1.htm>

Mag Earth globe \$15

<https://www.arborsci.com/magnetic-globe.html>



Magnaprobe \$6

<https://www.amazon.com/CMS-Magnetics%2%AE-Magnetic-Pole-Detector/dp/BooOQRGoHA>



Ferrofluid \$17 (add 50% rubbing alcohol and distilled H₂O)

<https://www.amazon.com/CMS-Magnetics-Magnetic-Ferrofluid-Dropper/dp/Boo8H4oLG4/>



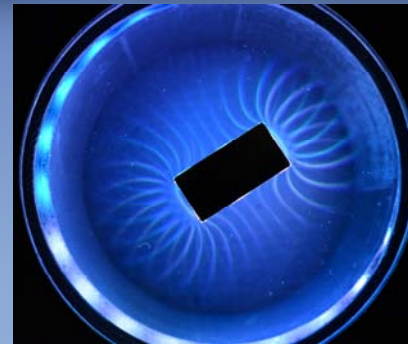
Space Weather Demonstration Models

Ferrocell \$80-\$500

<http://www.ferrocell.us>

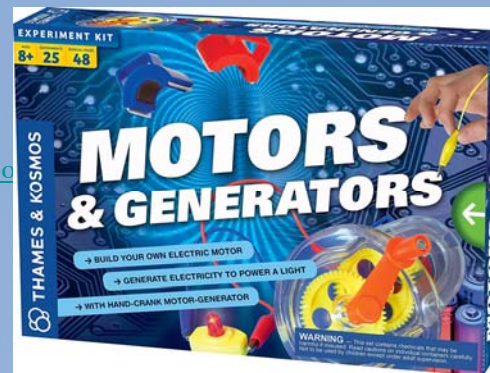
video: <https://www.brighteon.com/5822699298001>

DIY: <https://www.instructables.com/id/Ferrocell-Magnetic-Fields-Viewer>



Motor/generator magnet kit \$23

<https://www.amazon.com/Thames-Kosmos-Motors-and-Generators/dp/B000000000>



Lenz's law: copper tubes magnetic race ~\$20

<http://www.coolmagnetman.com/magpipes.htm>

