

Introduction



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What we do:

While we create a variety of graphics for proposals (covers, figures, logos, foldouts), we also provide services such as poster design and printing, graphics for scientific papers, 3D art, signs, name badges, tent cards, etc. Our Graphics department create visually compelling art that represents the exciting nature of this Division's work.

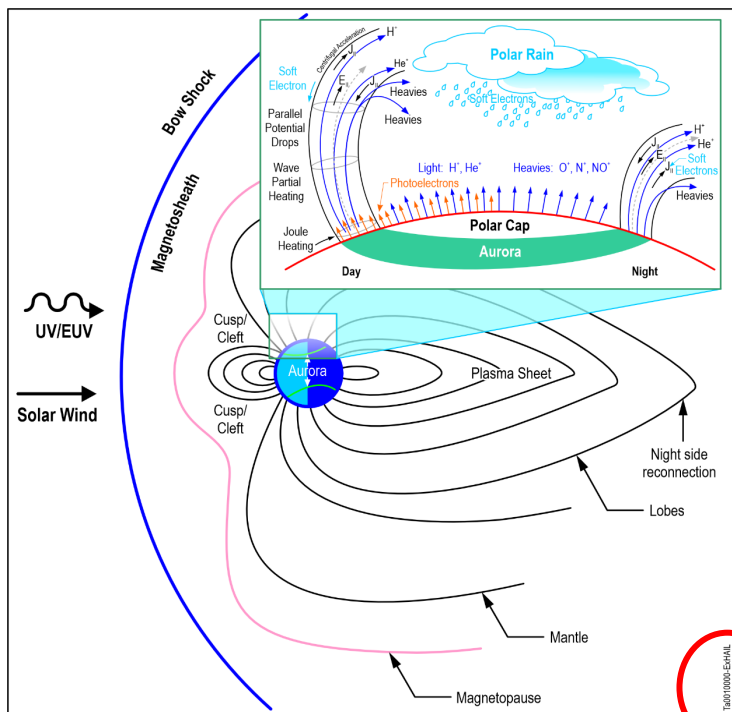
- We utilize design applications such as Adobe Photoshop, Corel Draw, InDesign, Key Shot, Procreate, and Illustrator.
- We create compelling visuals that convey complex information
- We provide support from start to finish.



Communication, Conceptualization, and Organization

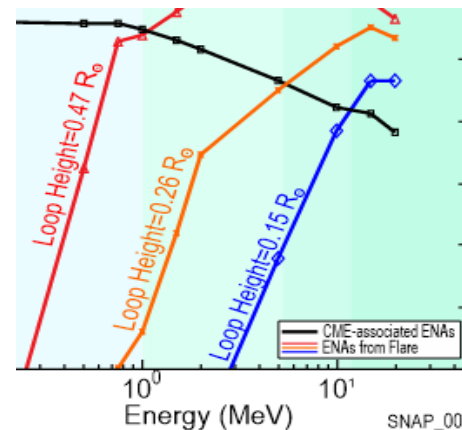
- **Open and direct communication helps us understand how to provide support efficiently and effectively.**
Not only is it the foundation of helping us understand what to do and how to do it right, it allows us to translate complete scientific concepts into visually engaging graphics that captivate a variety of audiences (especially reviewers).
- **Conceptualization helps us envision a team's ideas.**
We use information from the team to create compelling materials such as illustrations, data, figures/diagrams, and utilize 3D models to convey complex concepts.
- **Organization helps us minimize inaccuracy and indecision.**
Our team has a numbering system for organizing files.
Each graphic is given a number that helps us work more efficiently with teams to quickly access the requested art.

A sample of numbering system



74910000_EnvM

5 point text



s at 1 AU discriminate between CME shock and acceleration; ENAs associated with CME shocks; broad range of energies, while only ENAs above the near-Sun environment due to high velocity during a flare; expected energy spectra for loop heights are shown [Li et al. 2022].

SNAP_001_RevC5

5 point text



Foldouts

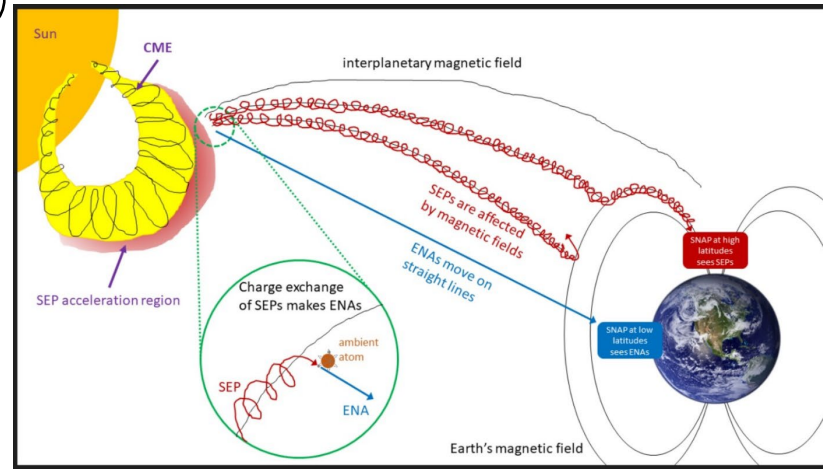
Information that helps us efficiently produce proposal foldouts

- How many foldouts will this proposal have?
- The type and title of foldouts needed for the proposal, e.g., Spacecraft, Flight System, Instrumentation, Science Data Flow, Science Traceability Matrix, etc.

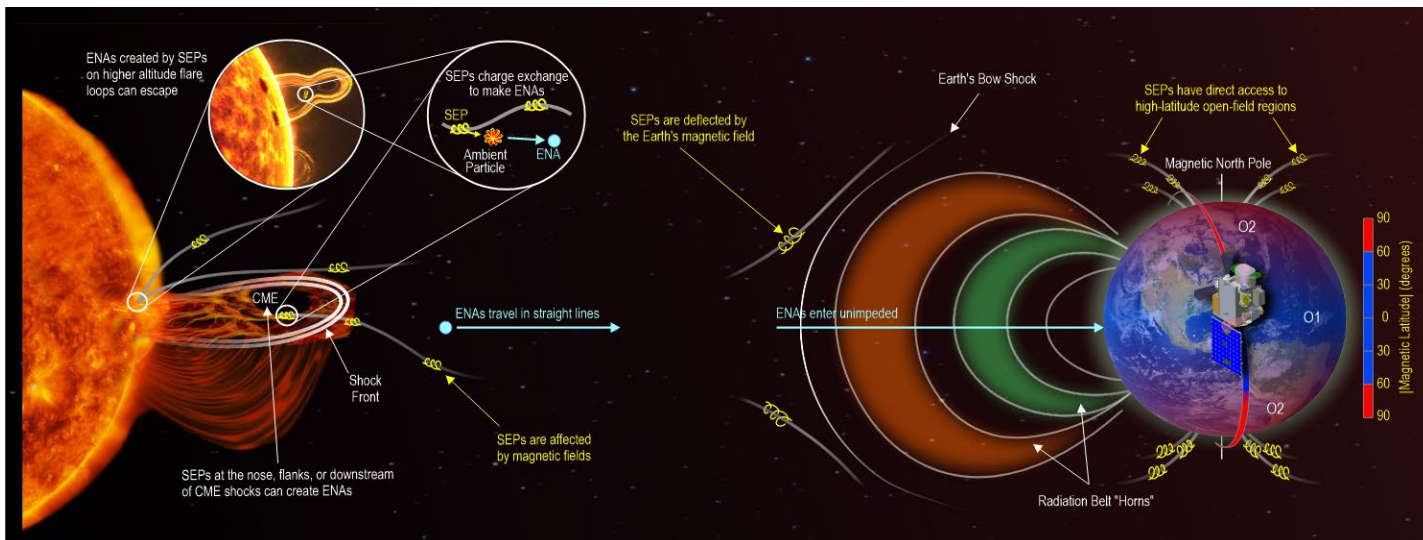
Figures

- A) Scientist's draft
- B) Final artwork used in a proposal (after several revisions)

A



B

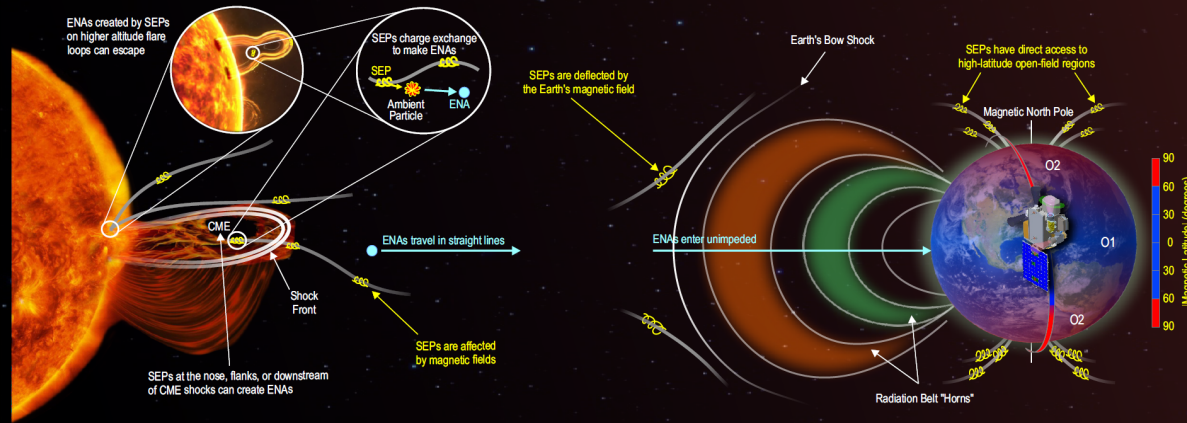


Finalized art work compiled and organized into a proposal foldout.

SNAP Science Objectives

Objective 1: Determine the sources, mechanisms, and conditions under which SEP protons are accelerated near the Sun.

Objective 2: Identify the physical processes that modify SEP properties after they are accelerated near the Sun.



Mission Design & Observation Strategy

Novel use of low Earth orbit (LEO) provides concurrent measurements of energetic neutral atoms (ENAs) and solar energetic particles (SEPs) on the same platform.

O1. At mid- to near-equatorial latitudes, Earth's magnetic field filters out all charged particles, enabling the two Sun-viewing neutral atom sensors to measure solar ENAs with high signal-to-noise ratio (SNRs). SNAP sensors are optimized for measuring >0.5 MeV ENAs from SEPs, thus avoiding the lower energy background due to magnetospheric ENAs.

O2. In the high-latitude polar cap regions, Earth's field lines are connected to the interplanetary magnetic field, thus providing the three zenith-pointing ion sensors direct access to SEPs. Two high energy ion sensors use the geomagnetic cutoff technique and extend the energy range of direct lower-energy charge state measurements from a dedicated ion sensor.

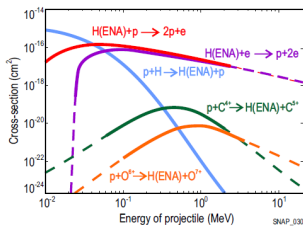
The first-ever NASA Heliophysics mission dedicated to image solar ENAs

SNAP fills critical knowledge gaps in SEP physics using two key observational missing links – ENAs and ionic charge states.

SNAP provides the first-ever production maps (B), arrival time profiles (C), and energy spectra (D) of solar ENAs along with measurements of SEP ionization charge states, energy spectra, and heavy ion composition to achieve full closure on its two science objectives.

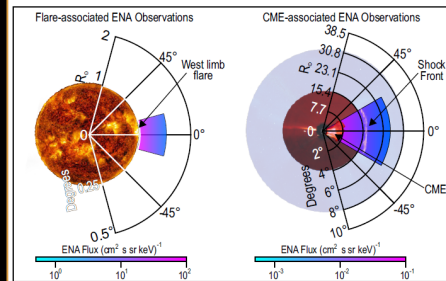
SNAP uniquely probes regions of our Sun's atmosphere inaccessible to in-situ missions to reveal SEP sources, conditions, and mechanisms and radically transform our understanding of near-Sun particle acceleration.

A. Charge exchange cross-sections for ENA production and extinction at the Sun.



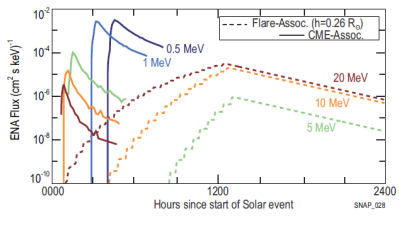
SEP protons charge exchange with the dense ambient plasma and create ENAs [Wang et al. 2014, 2022]. In regions where the plasma density is sufficiently high, i.e., <math><0.1-0.5 R_{\odot}</math>, some fraction of these ENAs re-ionize and become extinct; ENAs above $\sim 0.5 R_{\odot}$ can escape into interplanetary space.

B. SNAP ENA imaging distinguishes between point-like flare sources and extended CME sources.



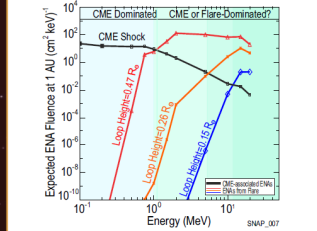
Simulated images of 2 MeV ENAs produced by SEPs accelerated at a flare (left) and a CME shock (right). Differences between the point-like flare sites and the relatively broader CME-shock acceleration regions allow SNAP to distinguish between the SEP sources and acceleration processes.

C. SNAP measures the arrival time differences between CME and flare-associated ENAs.



ENA arrival time-profiles of 0.5-20 MeV ENAs produced by SEPs accelerated near the Sun by a CME shock and a flare with maximum loop height of $0.26 R_{\odot}$. ENAs produced by CME-shock accelerated SEPs are observed at all energies with a sharp onset, while ENAs above ~ 1 MeV produced by SEPs accelerated in flares have a more gradual onset due to the slow rise of the post-flare loop to higher coronal heights, which is necessary for ENAs to escape, leading to clearly distinguishable temporal profiles at Earth [Wang et al. 2014, 2022; Li et al. 2022].

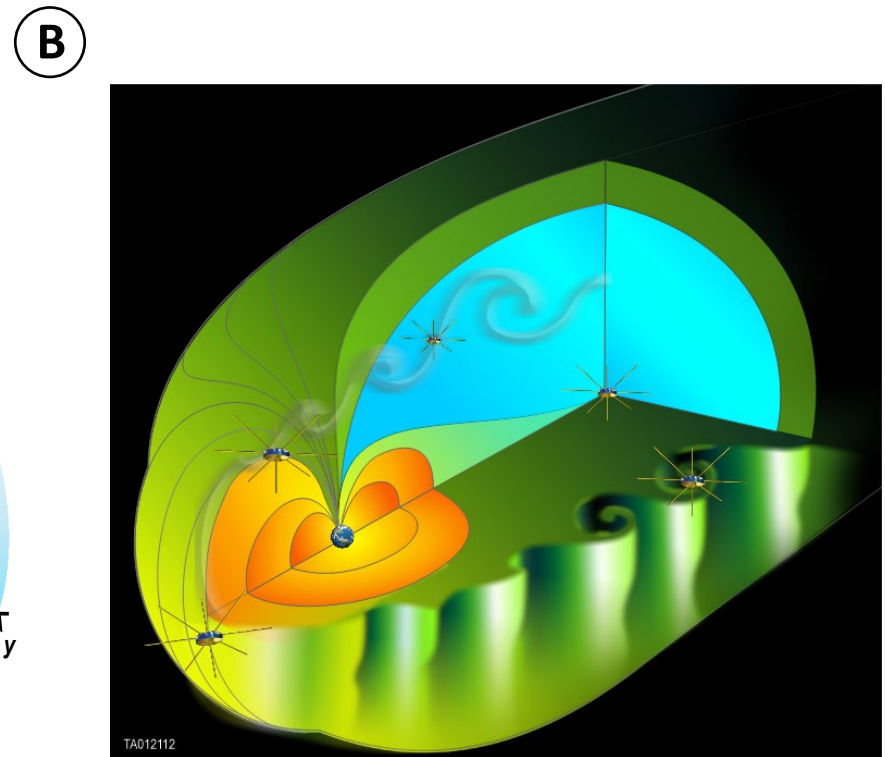
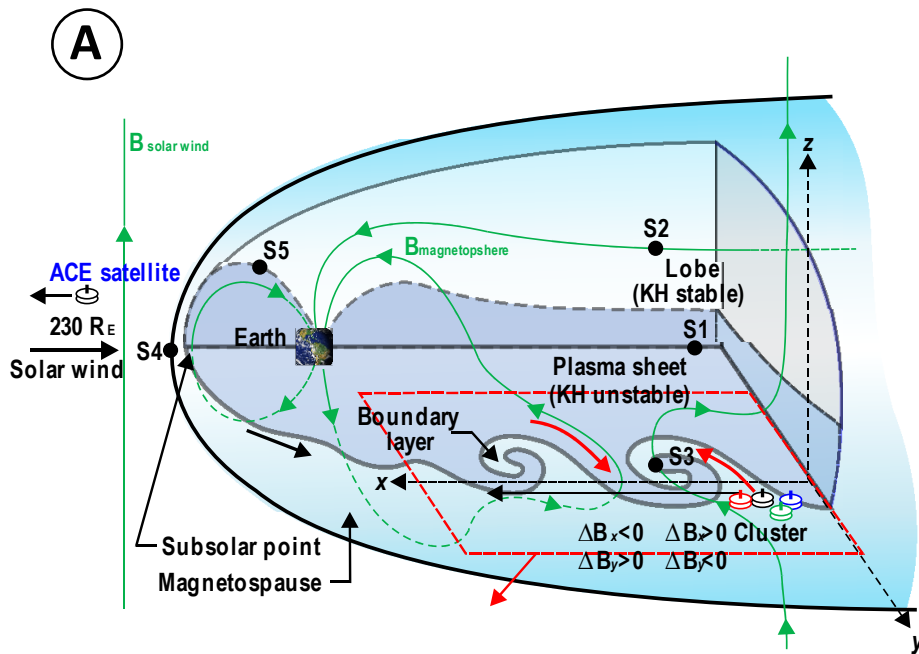
D. SNAP measures distinct ENA spectral shapes from CME shocks and flares.



ENA spectral shapes at 1 AU discriminate between CME shock and flare sources of SEP acceleration. ENAs associated with CME shocks are observed over a broad range of energies, while only ENAs above ~ 1 MeV can escape the near-Sun environment due to high atmospheric density during a flare; expected energy spectra for three different flare loop heights are shown [Li et al. 2022].

A) Scientist's 2D art

B) Finalized 3D artwork used in a proposal (after several revisions).





Logos and Covers

Logos and Covers – Our team designs logos and covers from a team's concept of the meaning and impact of their mission. After several iterations and team approval, we incorporate the logo onto the cover, factsheet, and foldouts. This helps us create a compelling cover for the proposal with a consistent "look" that visually ties all the pieces together. The following are types of information that help us create a meaningful logo and/or cover:

- The type of mission (Planetary, Earth Venture, Heliophysics, etc.)
- The name of the mission and its acronym
- Images of the spacecraft and/or instrument to be used
- Logos of other organizations involved.
- Preferred file type

A sample of a logo from sketch to finish



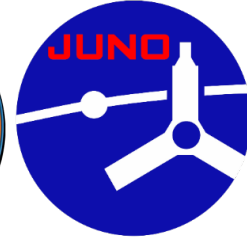
Poseidon Progression Artwork + final Logo



Finalized Logo

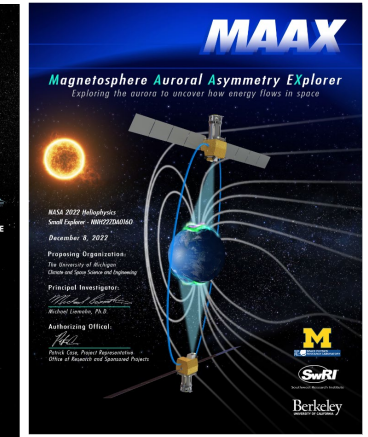
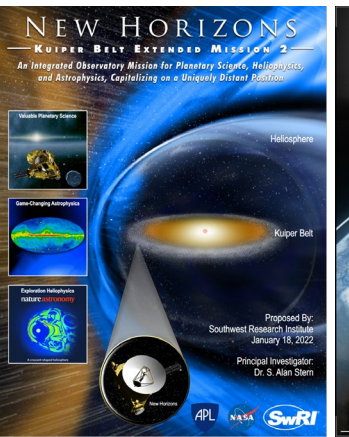
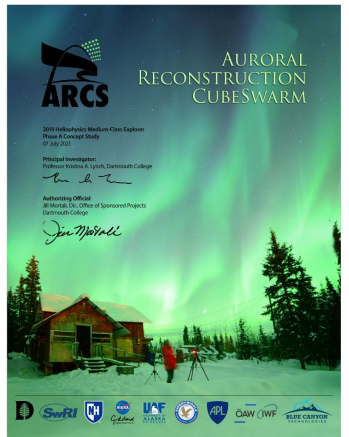
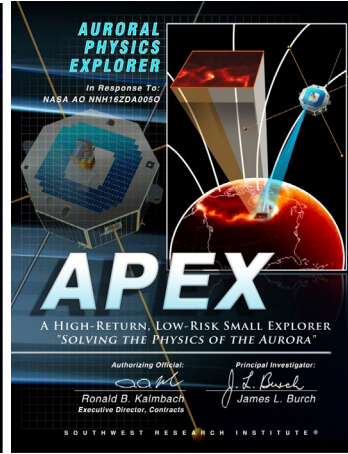
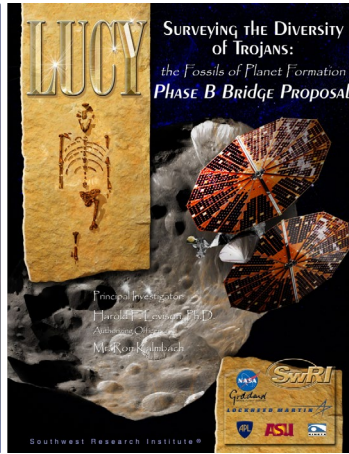
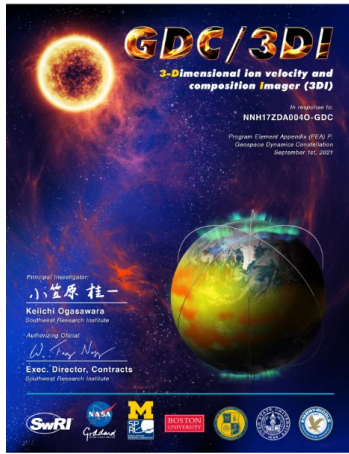
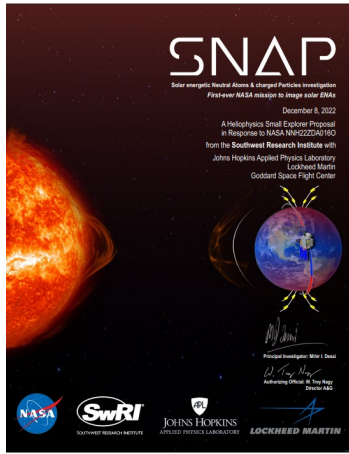


Samples of Logos





Samples of Covers





Questions and Answer:

Thank you for your time.

Please feel free to contact our Graphics Department for assistant.