

# Polarimeter to Unify the Corona and Heliosphere



## Shining New Light on Diverse Views of the Sun

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# PUNCH Public Engagement



Outreach  
for the  
**NASA**  
PUNCH  
mission



PUNCH Outreach Logo

## PUNCH Outreach Motto

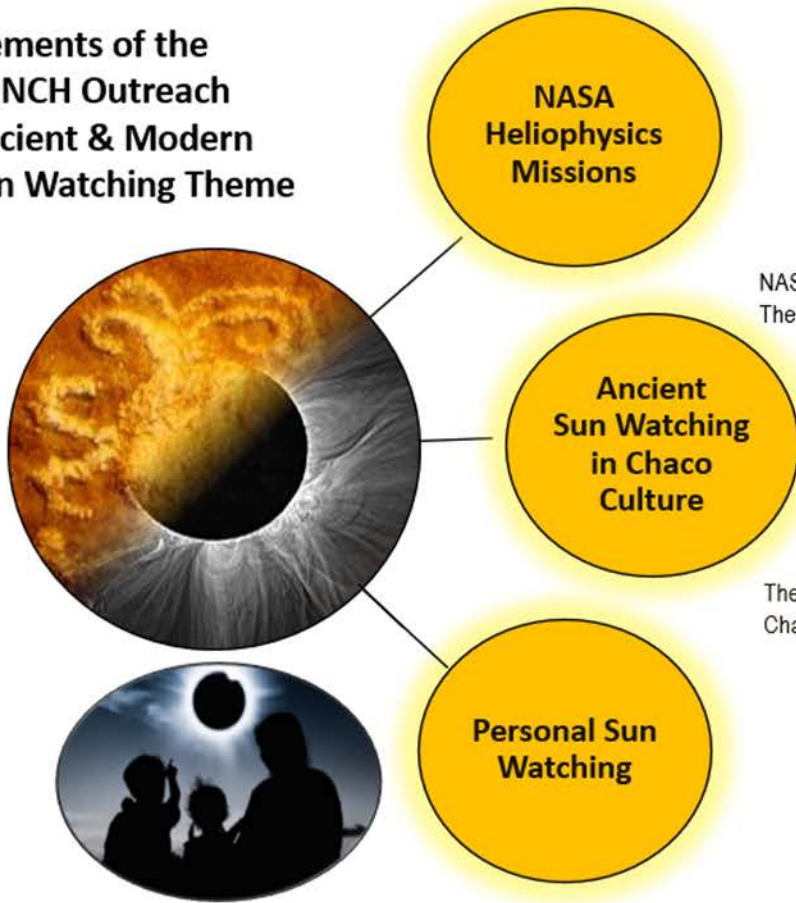
Shining New Light on Diverse Views of the Sun with our Ancient & Modern Sun-Watching Theme

**Scientific**  
**Cultural**  
**Historical**

**Personal Observation – DIRECT**  
**Personal Observation - INDIRECT**

Shining New Light on Diverse Views of the Sun

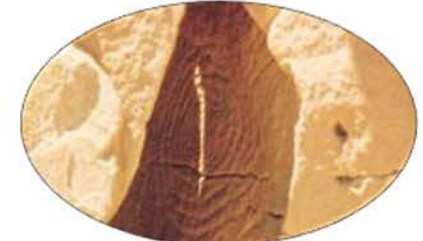
Elements of the PUNCH Outreach Ancient & Modern Sun Watching Theme



Funded collaboration between PUNCH and Parker on planetarium films and openness to collaboration with other missions



NASA Exploration of the Sun is a natural extension of age-old human practice of observation of the Sun rhythms and mysteries. There is world-wide evidence that all human beings are descended from cultures who observed the Sun.



There are >20 indigenous tribes in the 4-Corners region and Mexico who have ancestral and historical ties to Chaco. Chaco is also a World Heritage site with extraordinary evidence of ancient solar observing and thus has broader appeal.



"Modern Sun Watching" includes the invitation to ALL contemporary people to be present for sunrise, sunset, light & shadow effects, and eclipses.

Our outreach theme makes NASA Sun science relevant to **diverse learners** via **personal & cultural connections** to **Sun-watching**.





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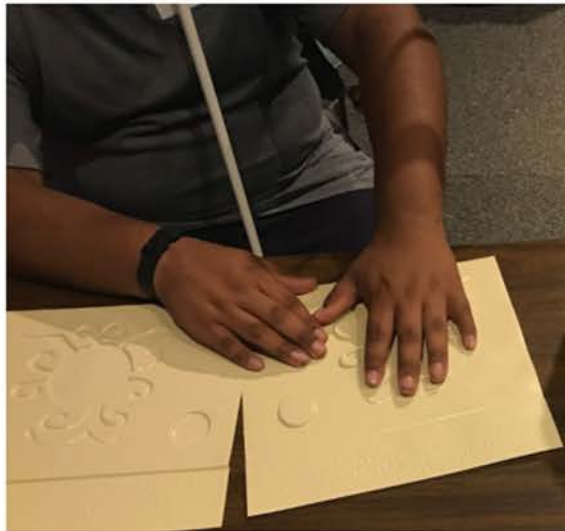
## Populations We are Collaborating With and Learning From



Native American  
& Hispanic/Latinx  
youth & families



Learners at the  
Haak'u Community  
Academy at the  
Pueblo of Acoma



*PUNCH Outreach field tests all its products and learns from scientists, Blind & Low Vision learners, the descendants of Ancestral Puebloan people, and other collaborators how to be of greater benefit to ALL people.*

Blind & Low-Vision  
(BLV) Learners



Girls in STEM



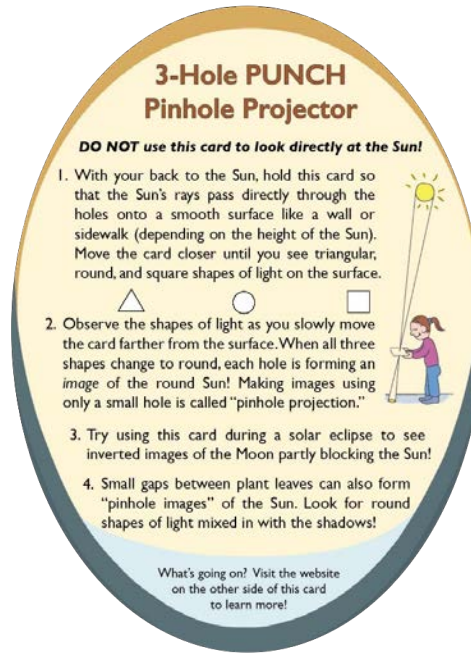


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# Collaborating with the Community to Prepare the Community



FRONT



BACK

New Mexico Museum of Natural History & Science  
Pueblo of Acoma – Haak'u Community Academy  
Chaco Canyon  
AAS Eclipse Task Force

National Hispanic Cultural Center  
Petroglyphs National Monument  
Southwestern Polytechnic Institute  
Balloon Museum (NASA TV webcast)

Indian Pueblo Cultural Center  
Museum of Indian Arts & Culture  
University of New Mexico, Maxwell Museum





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# Sun Fun Day at Pueblo of Acoma on 20 May



Making personal & cultural connections to ancient and contemporary Sun-watching both ongoing within the Pueblo in traditional ways, and in collaboration with NASA missions like PUNCH.



All Acoma photos by Cherylynn Morrow



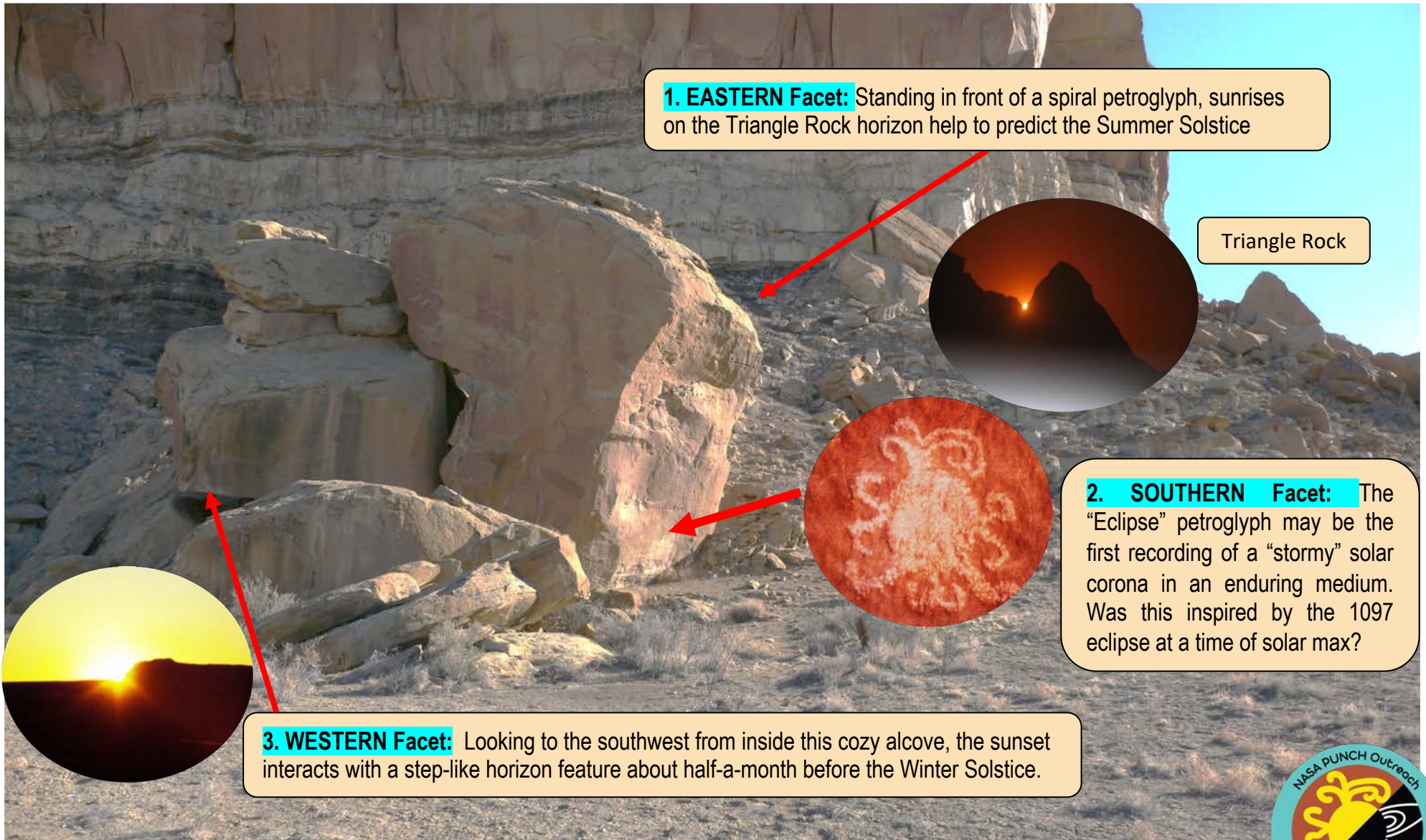


**Chaco is a World Heritage Site and an International Dark Sky Park.**



# Where is the “Eclipse” Petroglyph in Chaco Canyon?

an Ancestral Puebloan solar observing site in Chaco Canyon, New Mexico





# The “Eclipse” petroglyph in Chaco

(1097?)



## 1097? Chaco Canyon, New Mexico

Rock carving in sandstone by Ancestral Puebloan people in Chaco Canyon, NM. Was this design inspired by the 1097 total solar eclipse during a period of high human activity in the Canyon and high solar activity on the Sun? (Solar peak of activity independently estimated to have occurred ~1098)

Interpretation by Solar astronomer Kim Malville and his colleague Vaquero



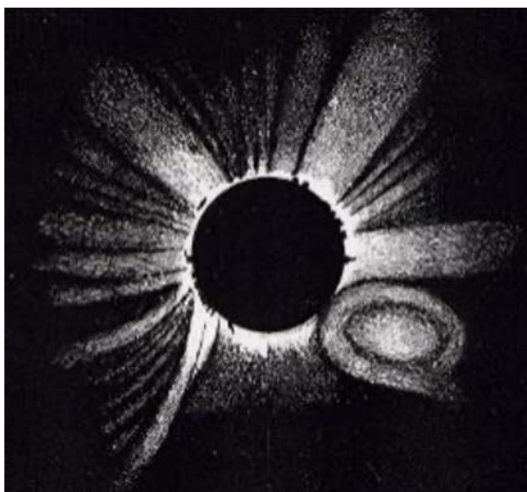


# Sample of Other Human Representations of a “Stormy” Solar Corona Through Time

**1097** Petroglyph with Prominences and/or CME?



**1860** Hand drawing with (now known) CME



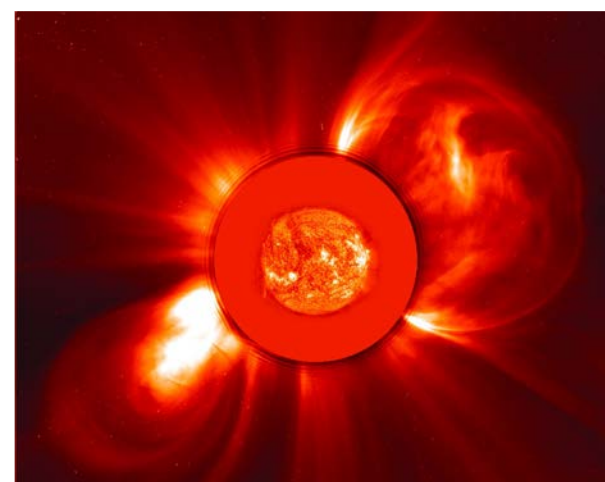
**1918** Painting with Prominences (pink)



**1980** Ground-based Photograph (solar max)



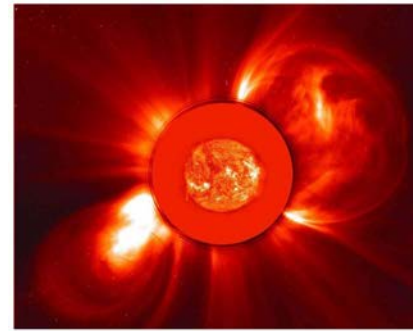
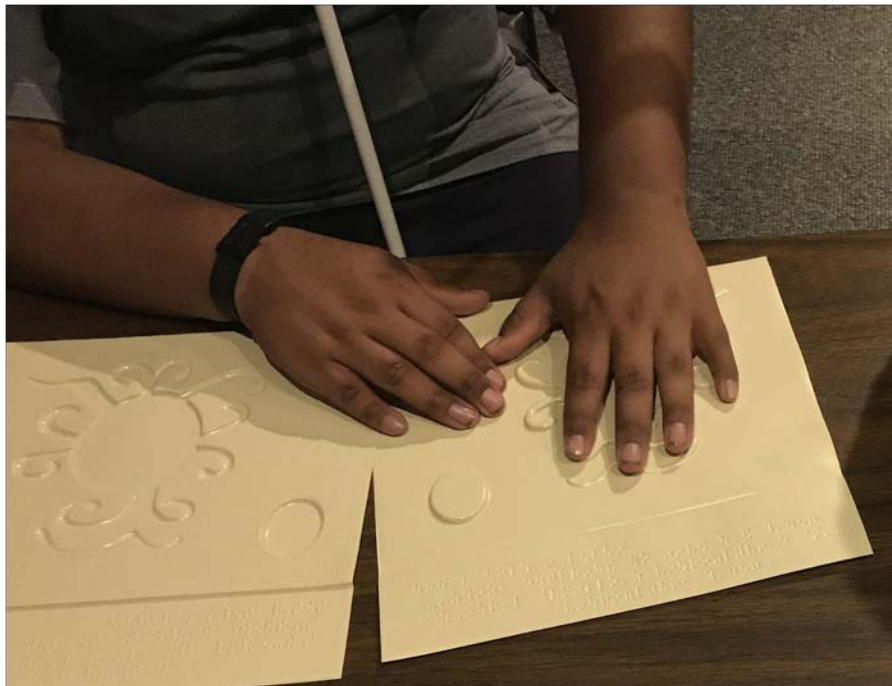
**2020** Composite Photograph with CME



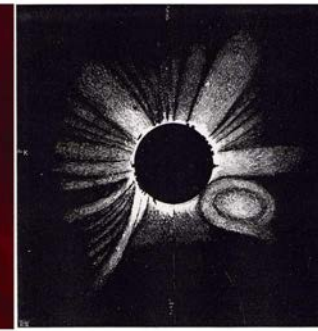
**2000** NASA Spacecraft Image with two CMEs

# Using Thermoform Tactile Art Representations of the Solar Corona

- Field testing with Blind Learners in Colorado and Arizona
- Now working on Mark 3 versions based on feedback received



NASA spacecraft image, 2000



Hand drawing, 1860

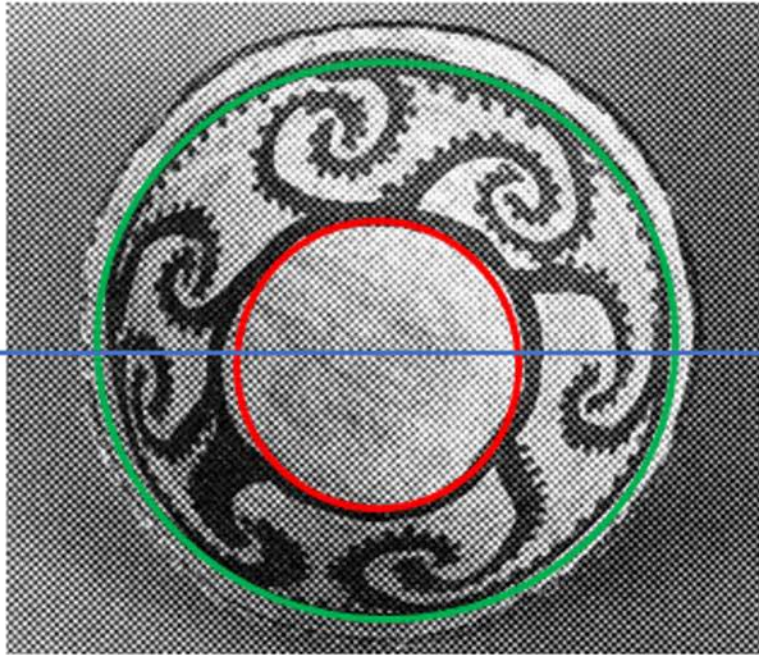


Petroglyph, 1097



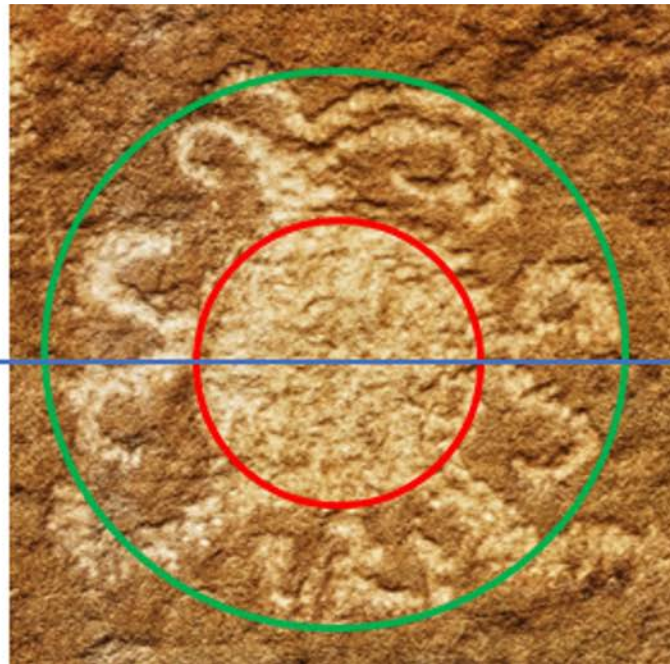
Thermoform tactile art representations of the solar corona  
created by (now Dr.) Nicole Johnson of the CU Atlas Institute

# Comparing the Curlicue Designs of an Ancient Pottery Bowl to the “Eclipse” Petroglyph



## Ancient Pottery Bowl from Chaco Culture

Was the curlicue design on this ancient pottery bowl inspired by the 1097 total solar eclipse? Or was it already an artistic motif for representing the Sun prior to this eclipse?



## 1097? Chaco Canyon, New Mexico

Was the curlicue design of this Ancestral Puebloan petroglyph in Chaco Canyon inspired by the 1097 total solar eclipse during a period of high solar activity on the Sun?



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NASA PUNCH website:  
<https://punch.space.swri.edu/>

# Thank You!

We are inviting New Mexicans (and all people) to safe Sun-watching during the eclipses along with heightened awareness of the rich world-class historical and cultural heritage of Sun-watching this region exemplifies... as well as enhanced awareness of New Mexico's engagement in collaboration with NASA's exploration of the Sun via missions like PUNCH.



Scan here to receive our 1-page monthly newsletter which provides updates on all PUNCH Outreach products or visit:

<https://tinyurl.com/PUNCHOutreachProducts>