

# Light: A Spectrum of Utility

The 2014 SPS SOCK



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# The Interns

Kearns Louis-Jean

Xavier University of Louisiana,  
2015



Mark Sellers

Rhodes College,  
2015



# Background on the SOCK

- Science Outreach Catalyst Kit
  - Assortment of materials and activities
- Designed and assembled by the interns and staff
- Targeted at Society of Physics Students chapters
  - College/university students in SPS
  - 25 chapters receive a SOCK

# The importance of outreach

- Outreach—Providing services to populations who might not otherwise have access to those services.
  - Applies to both community schools AND SPS chapters!
  - Not all SPS chapters are “outreach ready”
  - Not all classrooms have the resources to perform these activities

# The theme of the SOCK— Light: A Spectrum of Utility

- United Nations “International Observances”



INTERNATIONAL  
YEAR OF LIGHT  
2015

- What light tells us about the structure of matter
- The importance of light-based technology



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# A common thread

- Both international years involve light being used as a tool!
- The challenge: finding a cohesive blend of the two
- This SOCK focuses on *properties of light* and *how we can use them to understand matter*.

# Research and Development

Brainstorm

Acquire materials for  
the prototype  
activities

Test activities. Look for:

- Cost
- Reliability
- Simplicity

Write the manual!

- Refine activities
- Explanations
- Parts list
- Questions for students



# SOCK Activities

Light as a tool

- Transmit information
  - Fiber optic cables
- Energy
  - Microwaves
- Measure distance
  - Speed of light
- Identification and security
  - Fluorescent materials

- Understanding matter
  - Diffraction patterns
  - Polarization
- Predict material properties
  - Atomic structure matters!

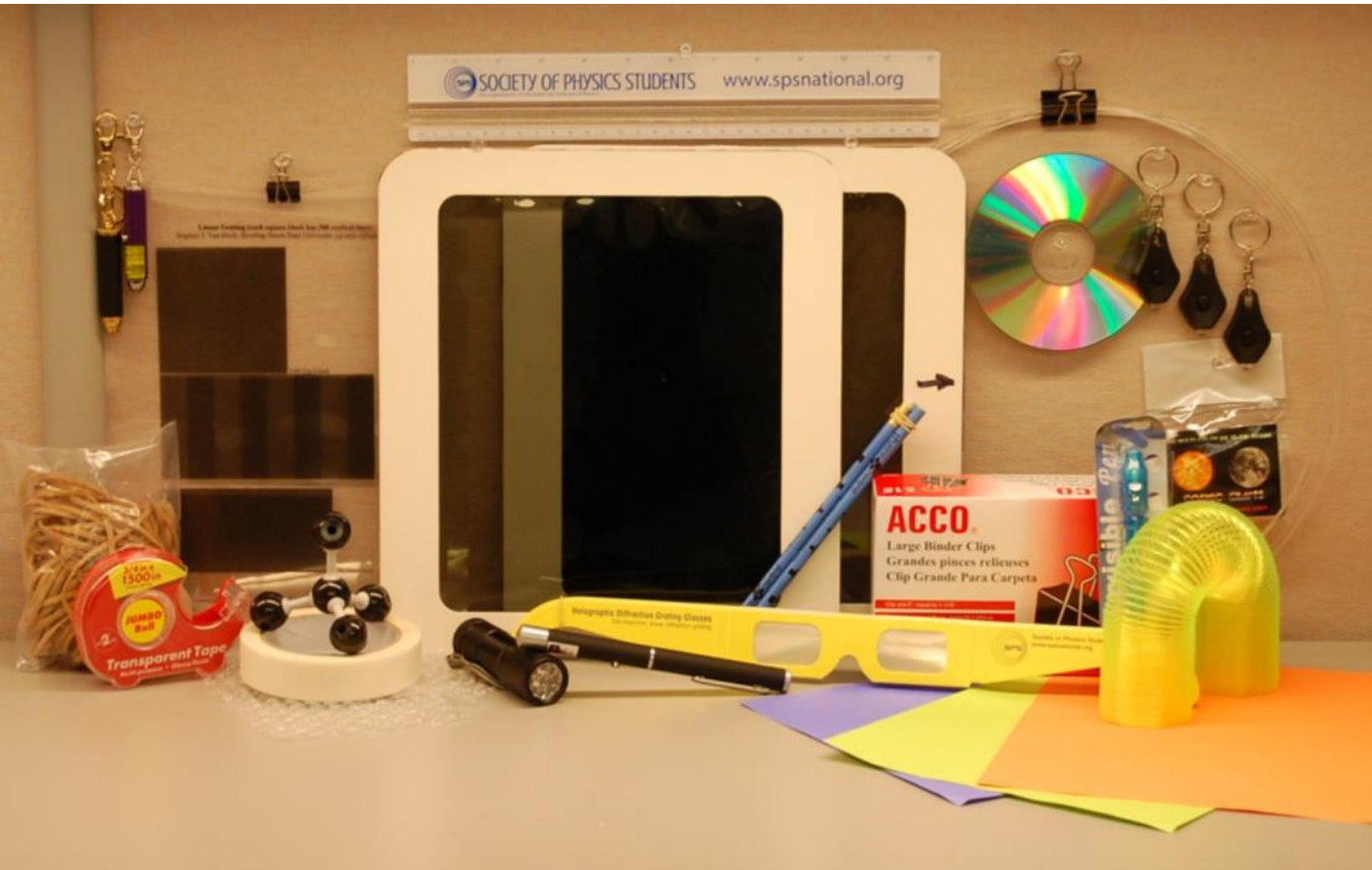




# Activity!



# SOCK Contents, *a teaser*



1. Red lasers
2. Diffraction grating
3. Rulers
4. Polarizers
5. Fiber Optic Cable
6. CDs
7. LEDs
8. UV Beads
9. UV Pen
10. Slinky
11. Binder clips
12. Pencils
13. Diffraction glasses
14. Fluorescent Paper
15. Green laser
16. UV Flashlight
17. Bubble wrap
18. Diamond molecular kit
19. Bubble wrap
20. Transparent tape
21. Rubber bands



# Outreach Events this Summer



- Howard County STEM Festival
- Tuckahoe Elementary
- NIST Day Care and Summer Camp
- NIST Summer Institute for Middle School Teachers
- 9<sup>th</sup> Grade Girls Physics Camp (U. Maryland)



# Howard County Stem Festival



# Tuckahoe Elementary



# NIST Day Care and Summer Camp



# 9<sup>th</sup> Grade Girls Physics Camp (UMD)



# NIST

**National Institute of  
Standards and Technology**  
U.S. Department of Commerce

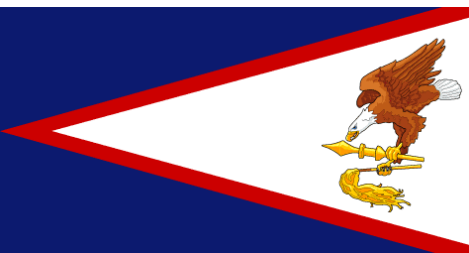


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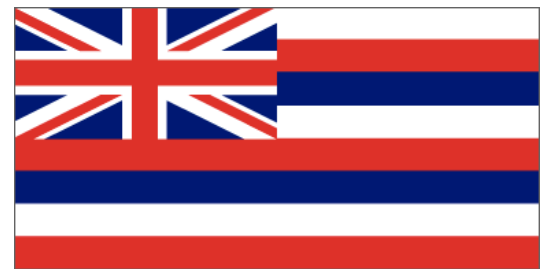
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**NIST Summer Institute**  
for Middle School Science Teachers



- 22 middle school science teachers
- Lectures, Demos, Experiments, Tours, and Seminars
- Connecting Teachers with Scientists and Engineers
- Connecting teachers from different parts of the United States and its territories



# My Role



**NIST Summer Institute**  
for Middle School Science Teachers

- Helped organize teacher training activities
- Documented the week
- Collected any feedback



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# Summer Institute for Middle School Science Teachers





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