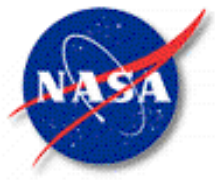




Mirror Development  
Technology Days 2014  
In the  
Government

H. Philip Stahl, Ph.D.  
h.philip.stahl@nasa.gov  
(256) 544-0445



# Purpose of Tech Days

Mirror Technology is critical for NASA & DoD missions.

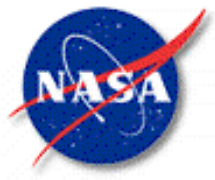
Topics discussed enable missions for next 10 to 20 yrs.

Tech Days has two Goals:

How are we Spending the Taxpayer's money

1. Is the Government Investing the Taxpayer's money wisely  
Are we funding 5 good ideas or 1 good idea 5 times?
2. Are we getting good value for our investment?
3. How can we coordinate our activities to maximize the efficacy of our investments.

Provide a networking opportunity for Vendors and Government.



# Thank You and Acknowledgements

## Organizing Committee

Dr. Petar Blake, NASA Goddard  
Space Flight Center

Hans-Peter Dumm, US Air Force  
Research Lab, Space Vehicles  
Directorate

Ron Eng, NASA Marshall Space  
Flight Center

Dr. Carol R. Lewis, Jet Propulsion  
Laboratory

Dr. Harley Thronson, NASA  
Goddard Space Flight Center

Dr. H. Philip Stahl, NASA  
Marshall Space Flight Center

## New Mexico Optics (nmOptics):

Lynore M Abbott  
Cynnamon Spain  
Bryan Kelchner  
Jim McNally

## SPIE

Marilyn Gorsuch  
Jeff Braswell  
Linda Warren



<https://optics.nasa.gov/tech>

Home  
Tech Days

**Technology Days 2014**

"Technology Days 2014" symposium will be held later this year. This annual meeting (invitation to see what is being funded by other agencies and to track the progress in these mirror technol

2014 Presentations

[Technology Days 2013 - Presentations](#)

[Technology Days 2012 - Presentations](#)

[Technology Days 2011 - Presentations](#)

[Technology Days 2010 - Presentations](#)

[Technology Days 2009 - Presentations](#)

[Technology Days 2008 - Presentations](#)

[Technology Days 2007 - Presentations](#)

[Technology Days 2006 - Presentations](#)

[Technology Days 2005 - Presentations](#)

[Technology Days 2004 - Presentations](#)

[Technology Days 2003 - Presentations](#)

[Technology Days 2002 - Presentations](#)

[Technology Days 2001 - Presentations](#)

Home  
Tech Days 2013

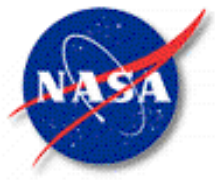


(Click for larger image)  
October 1st | October 2nd | October 3rd

**Technology Days 2013**

**Tuesday October 1, 2013**

#	Presenter	Title	Company
<b>Government Technology Needs and NASA SBIR Pre-Solicitation Workshop (OPEN)</b>			
00a	Stahl	Welcome	NASA
00b	Polidan	Logistics	NGC
00c	Watson	Welcome	NGC
00d	Hagenbuechle	Welcome	OSSC
1	Helble	NASA's Space Technology Mission Directorate Technology Needs	NASA
2	Lawson	NASA's Exoplanet Program Technology Needs	JPL
3	Shaklan	Starlight Suppression Technologies for Exoplanet Imaging	JPL
4	Grant	NASA SBIR Program	NASA
5	Lewis	Tailoring SBIR Technology Infusion to its Environment	JPL
6	Shaklan	NASA SBIR Topic S2 "Advanced Telescope Systems"	JPL
7	Stahl	NASA SBIR S2.03 "Advanced Optical Components" and E3.02 "Advanced Technology Telescope for Balloon Mission"	NASA
<b>SBIR Select Subtopic (OPEN)</b>			
8	Goodman	SIC Telescope for BENI Mission	Trex
9	Catanzaro	Systems Engineering Approach to Requirements Definition	CFE
10	Loomis	Low Cost CMB Telescope Development Status	Vanguard
<b>X-Ray Mirror Technology (OPEN)</b>			
11	Reid	Development Status of Adjustable Grazing Incidence X-Ray Optics	CFA
12	Michel	Be/BeO Metal Matrix Composite for Lightweight CTE Matched Structure	Materion
13	Jensen	Lightweight Scaleable Manufacturing of X-Ray Telescope Optics	ReliaCoat
14	Xin	Advanced Optical Metrology: XRAY Replication Mandrels & Mirrors	AOS
15	Singh	High-resolution detector for at-wavelength metrology of X-ray optics	RMD



# Information & Announcements

## Important Information

Coffee Breaks, Lunch and Receptions

Photograph

## Announcements

SPIE Email List Management & Distribution

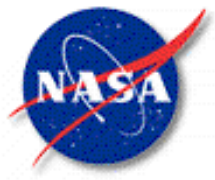
ITAR Sessions

Public Release Approvals

Any Agenda Changes

Exhibitors

Sponsors



# Tech Days 2015

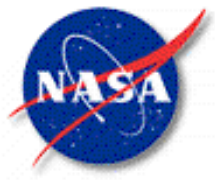
We have not yet signed a contract, but the plan is:

Marriott Greenbelt

Greenbelt, MD

Nov 17 to 19, 2015

JWST Optical Telescope Element will be under assembly at  
Goddard Space Flight Center.

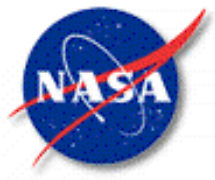


# Technology Days 2013



Welcome to  
Mirror Tech Days 2013  
*"the best Mirror Technology on this planet...and beyond!"*  
Thank you on behalf of your Meeting Organizers:  
NORTHROP GRUMMAN SPIE OPTICAL SOCIETY OF AMERICA

Mirror  
*"the best Mirror Technology on this planet...and beyond!"*  
Thank you  
NORTHROP GRUMMAN



# Technology Days 2013







# Tech Day Reserve Fund

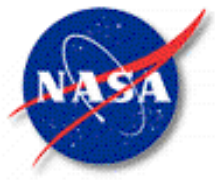
Tech Days 2013 added \$TBD surplus to Reserve Fund  
Net increase was \$TBD

Reserve Fund has two functions:

- Backstop Meeting Financial Risk
- Altruistic Activities

2012/13 Altruism:

- |         |   |
|---------|---|
| \$ 1000 | Optical Society of Southern California          |
| \$      | SPIE Southern California Student Chapter        |
| \$ TBD  | Best Optics Science Fair Project Student Awards |
| \$ TBD  | North Alabama Optics Apprenticeship Program     |



# North Alabama Optics Apprenticeship Program

## NAOAP Goals:

Provide real-world experience for talented students.

Develop laboratory practices and methods.

Help academia prepare a well educated work force.

Introduce optical science and engineering as a possible career path.

Establish early employment opportunities.

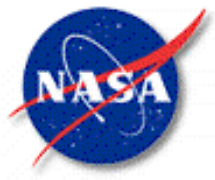
## NAOAP Program:

\$1350 Scholarship

Personal Mentor

End of Summer Oral Research Report

Applicants must be between the ages of 16-21.



# NAOAP 2014

Student:

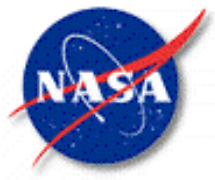
School

Major

Plans:

Mentor:

Project:



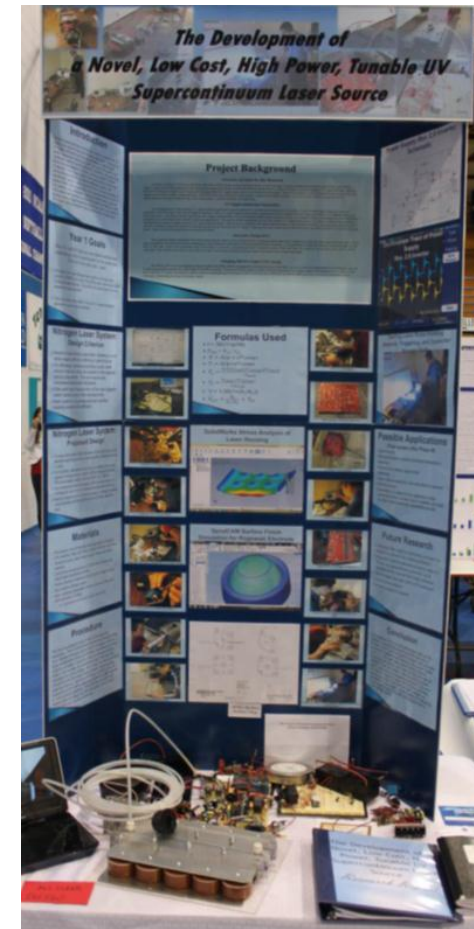
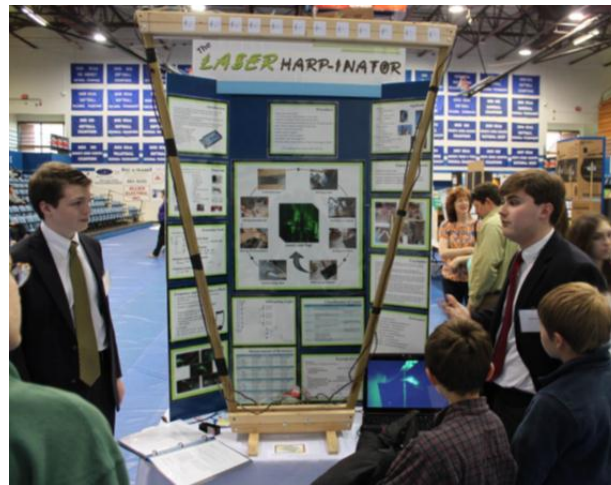
# 2014 Alabama State Science & Engineering Fair

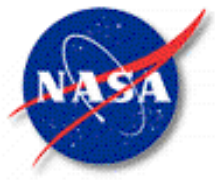
## Senior Division

1<sup>st</sup> Award (\$200): Joseph Lee, 11<sup>th</sup> grade; “Development of a Novel, Low Cost, High Power, Tunable UV Super-continuum Laser Source” (5<sup>th</sup> year of recognition)

1<sup>st</sup> Award (\$200): Paul Boulet & Andrew Carlson, 12<sup>th</sup> grade; “The Laser Harp-Inator”

2<sup>nd</sup> Award (\$150): Sean Benson, 11<sup>th</sup> grade; “More Than a Feeling - A 3D Haptic Vest for the Visually Impaired”





# 2014 Alabama State Science & Engineering Fair

## Senior Division

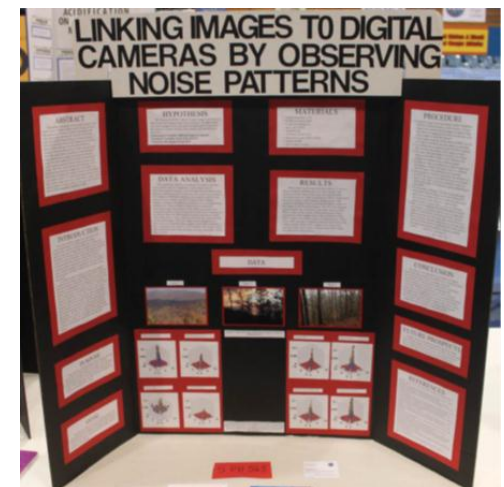
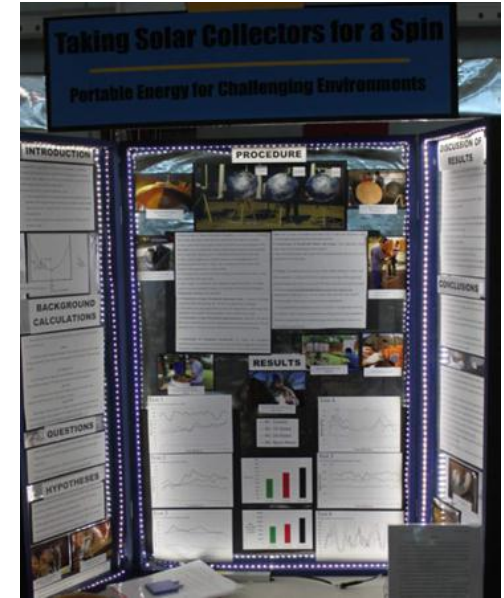
3<sup>rd</sup> Award (\$100): Timothy Brown and Gilchrist Grady, 9th grade; “Taking Solar Collectors for a Spin: Comparison of Tessellated Parabolic Collectors with Spun Resin Parabolic Collector” (2<sup>nd</sup> year of Recognition for Tim Brown)

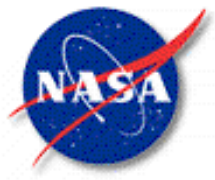
Honorable Mention (\$50):

Rupa Palanki, 9th grade; “Energy Harvesting via Pyroelectric Effect” (2<sup>nd</sup> year of Recognition for Rypa Palanki)

Davina Ho, 9th grade; “Solar Cooking”

Jasmin Revanna, 11th grade; “Linking Images to Digital Cameras by Observing Noise Patterns”





# 2014 Alabama State Science & Engineering Fair

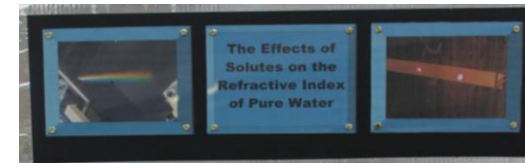
## Junior Division

1<sup>st</sup> Award (\$150): Therese Breithaupt, 7th grade;  
“Harvesting Solar Energy with Arduino”

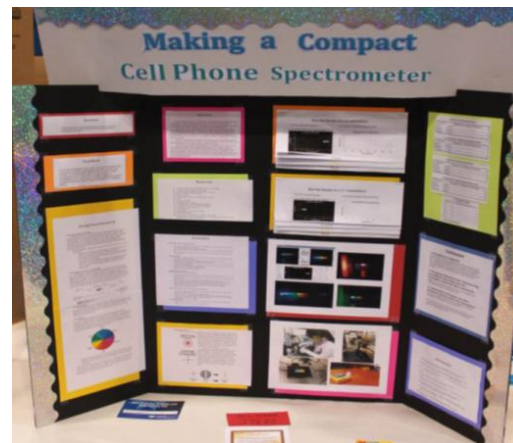


2<sup>nd</sup> Award (\$100): Christopher Wright, 6<sup>th</sup> grade; “The Patterns in Sunspots”

3<sup>rd</sup> Award (\$75): Erin Kuech, 6<sup>th</sup> grade; “The Effects of Solutes on the Refraction Index of Water”



4<sup>th</sup> Award (\$50): Sophie Guo, 8<sup>th</sup> grade; “A Compact Cell Phone Spectrometer”



# The International Year of Light

## and Light-based Technologies

### 2015



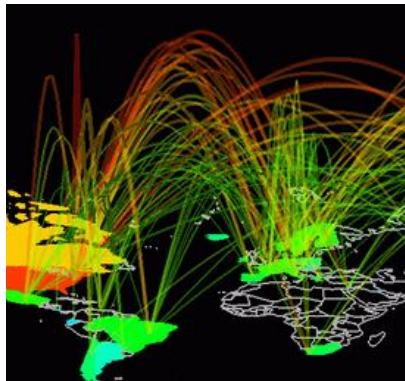
INTERNATIONAL  
YEAR OF LIGHT  
2015

Health Communication

Economy

Environment

Social





INTERNATIONAL  
YEAR OF LIGHT  
2015

# International Year of Light - 2015

Light is fundamental in human activities and optics & photonics are essential for the future development of our society.

IYoL celebrates importance of Light & Light based Technology

from photoemission to photosynthesis,  
from art to architecture,  
from physics to philosophy.

IYoL is opportunity for us to communicate importance of light and light-based technologies to the public and policy makers.

Get involved, spread the word and raise our visibility:

- Use the logo
- Sponsor an activity
- Plan a community outreach event
- Contribute video or images

Learn more at <http://light2015.org>



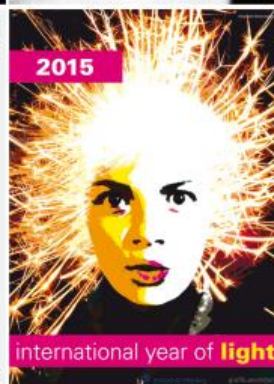
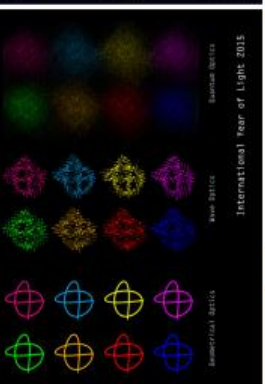
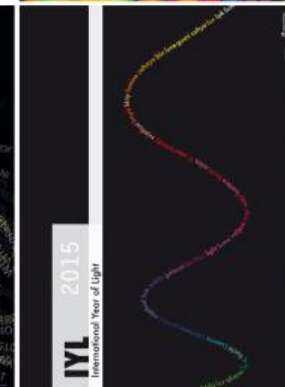
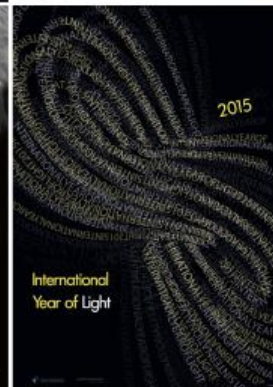
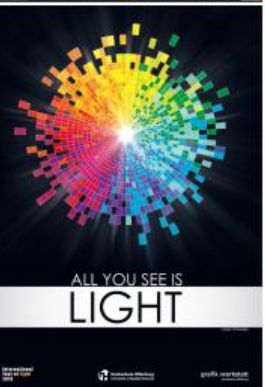
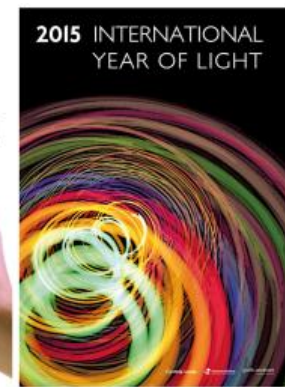
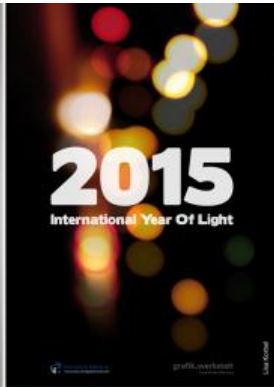






- Think beyond your typical outreach event
- Reach new audiences
- Publicity is important

# Art



**This is a once in a lifetime opportunity to share with the world the impact the light has on life and the future**





Thank You