



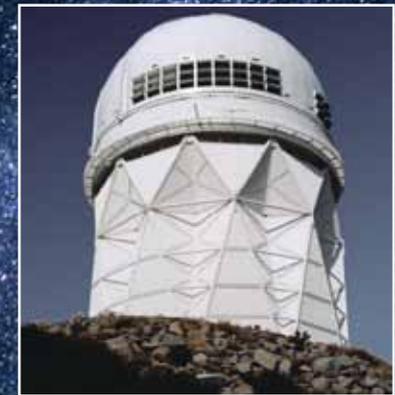
Maricopa Association of Governments

# DARK SKY

OCTOBER 13, 2010

# Pattern Outdoor Lighting Code

- § Purpose
- § Background
- § Economic benefit
- § Key aspects of the code



# Purpose of MAG Dark Sky Stakeholders Group

- § To develop a pattern code
- § To provide suggestions for updating existing codes

MAG Draft Pattern Outdoor Lighting Code

Table 4.1 LUMINAIRE SHIELDING STANDARDS

LIGHTING CLASS and lamp output	Shielding		Notes
	Distance from Fixture to Nearest Residential Property Line		
	< 50'	≥ 50'	
<b>Commercial, Industrial and Multi-Family Residential</b>			
<b>Class 1 lighting (Color Rendition):</b>			
Initial output ≥ 2,000 lumens	F	F	
Initial output < 2,000 lumens	F	A	1
<b>Class 2 lighting (General Illumination):</b>			
Initial output ≥ 2,000 lumens	F	F	
Initial output < 2,000 lumens	F	A	1
<b>Class 3 lighting (Decorative):</b>			
Initial output ≥ 2,000 lumens	X	X	
Initial output < 2,000 lumens	F	F	2
<b>Residential Lighting:</b>			
<b>All lighting classes</b>			
Initial output ≥ 1,000 lumens	F	F	
Initial output < 1,000 lumens	F	A	1,2,3

Notes to Table 4.1

Please refer to section 16.34 for a definition of "residential."

1. **Spot and flood lamps** must be aimed no higher than 45 degrees above straight down (half-way between straight down and straight to the side) when the lamp is visible from any off-site residential property or public roadway (Figure 4.1).

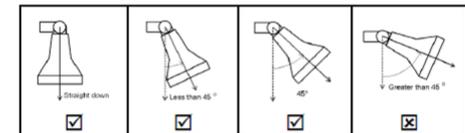


Figure 4.1. Spot light aiming

2. Seasonal decorations using typical unshielded low-wattage lamps shall be permitted from Thanksgiving through January 15.

# Purpose of a Lighting Code

- § Promote good lighting practice,
  - ú And to limit obtrusive lighting.
- § Promote good business.
- § Promote the community.
- § Help everyone see better.
- § **Save energy. Save money.**
- § Preserve dark skies for all.

# Background

- § Summer 2008 to Present
- § Formed Stakeholders Group
- § Held numerous meetings
- § Created Pattern Outdoor Lighting Code
- § Reviewed code
- § Held workshop
- § Revised code



# There is lots of astronomy in AZ.

Largest telescope on the planet on Mt. Graham. Good size astronomy industry.

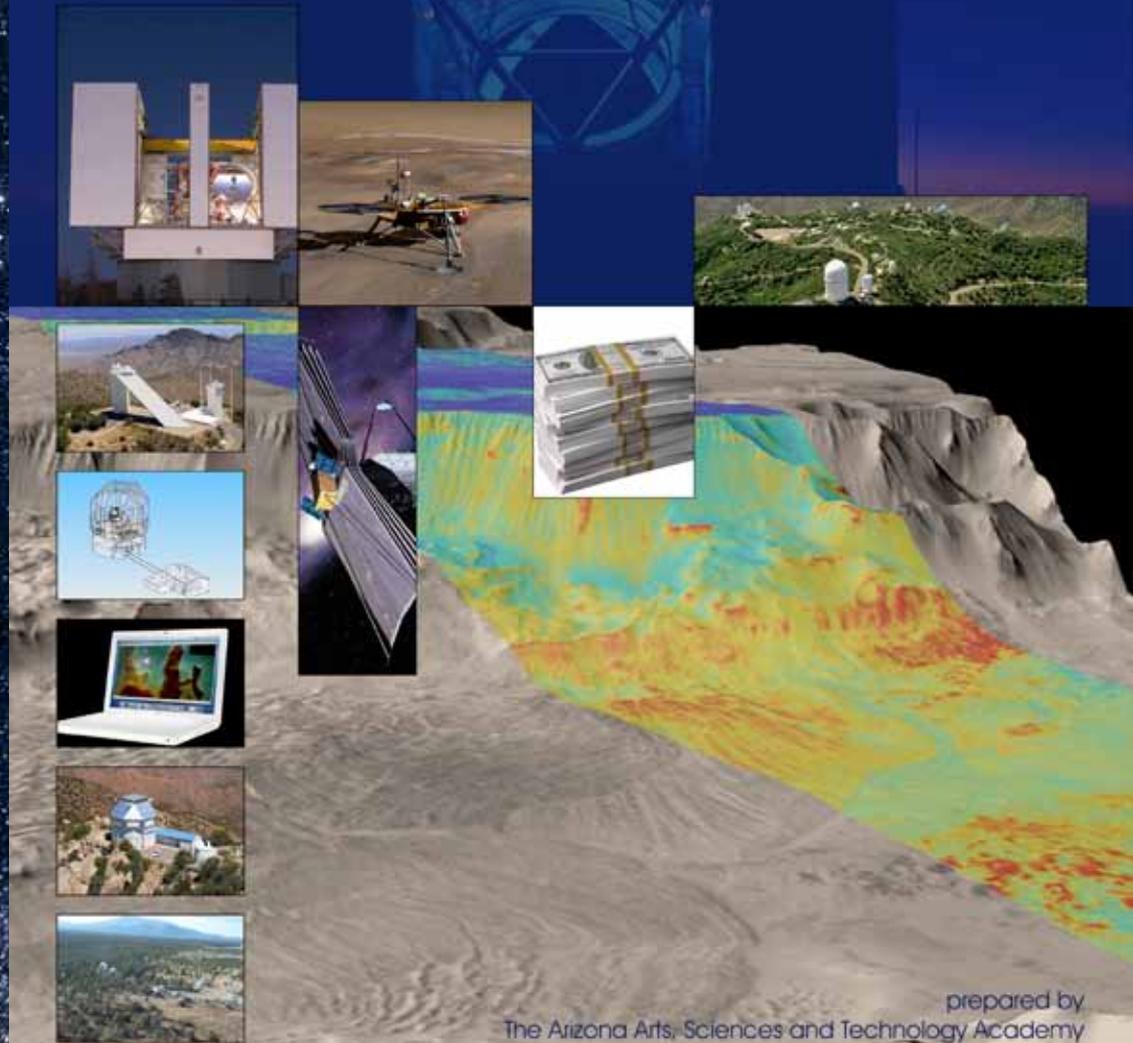
Blue dots are professional observatories. Red dots represent significant observatories where science is done, many of them are locations where teaching is done by the universities out of state or country because we have areas where there are dark skies.



Astronomy, Planetary Sciences,  
and Space Sciences Research Opportunities  
to Advance Arizona's Economic Growth

***Stargazing nets  
\$250 mil a year  
for Ariz. economy***

*The Arizona Republic  
January 17, 2008.*



prepared by  
The Arizona Arts, Sciences and Technology Academy



**Image of Phoenix at night taken from the International Space Station**  
(~220 miles above) (NASA, ISS CEO project)



Phoenix/Casa Grande sky glow as seen from Kitt Peak National Obs.

**March 28, 2008.** (KPNO photo by J. Glaspey)

# Key Aspects of the MAG Pattern Outdoor Lighting Code

- § Control: Shielding
- § Efficiency/Color: Lamp type
- § Amount: Lumens per acre
- § Brightness (signs): Nits





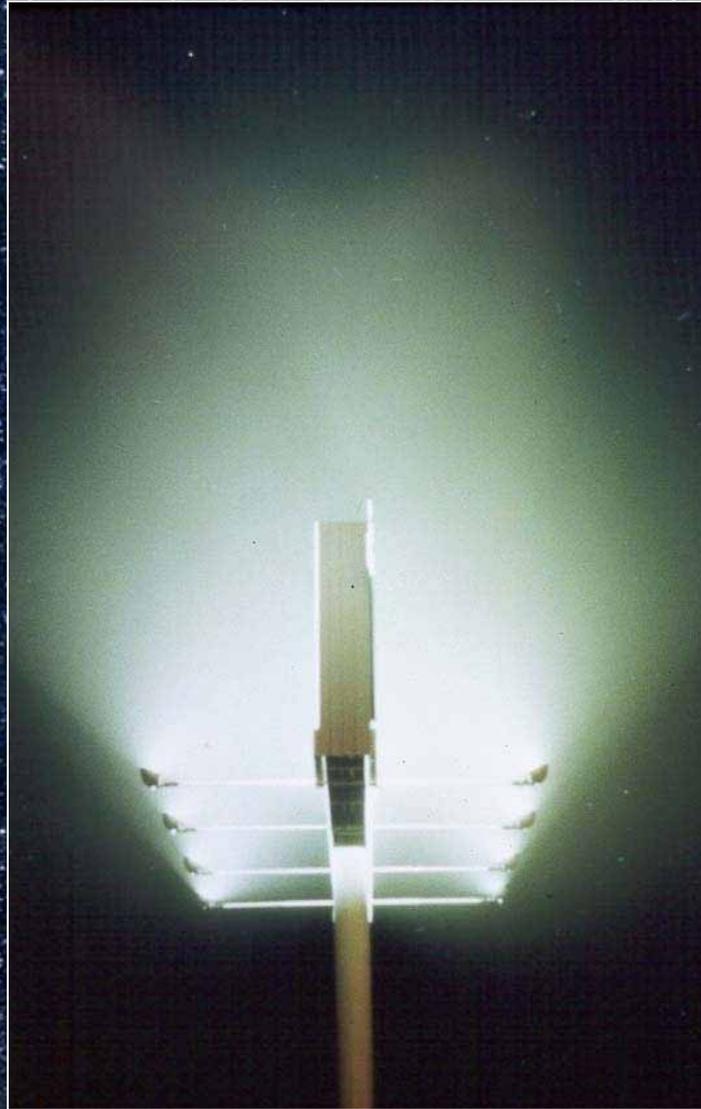
**Thorpe Park, City of Flagstaff**  
1970's vintage sport lighting  
Note glare and spill lighting



### **Benefits:**

- Light levels on playing field are twice previous.
- Players and spectators can see better.
- No light trespass into surrounding neighborhood.
- Better energy efficiency.
- Everyone wins.

**A billboard, seen from the side.**



**Externally illuminated sign**

# Cortaro & I-10

Parking lot lights are OFF

Signs illuminate the parking lot





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[HTTP://WWW.AZMAG.GOV/PROJECTS/PROJECT.ASP?CMSID=1082](http://www.azmag.gov/projects/project.asp?CMSID=1082)