



# *Optical Ethernet, a new path to Astronomical Resources*

*"An internet super science highway in rural America"*



**A 15 minute introduction**

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# Astronomical Resources

## *Dark Sky Islands and Spectral Stillness*



- Astronomy Islands
  - Socorro and Catron County-US 60, Highway 12 and 180
    - Bortle Dark Sky Rating=1
    - Elevation greater than 6000'
    - Dry climate
  - Rural regions with low populations and developments
  - Astronomy Islands vanish with population growth
  - Remote-access observatories open Astronomy Islands without population influx
  - Intelligent fiber optic Ethernet services creates remote observatories while protecting resources and encouraging economic health
  - Astronomical resources can be served and protected through broadband services
  - Let's see an example...



# 2<sup>nd</sup> Supernova Discovery achieved in Pie Town remotely

From Isaac Cruz's webpage

- *"This is very exciting! I discovered ANOTHER supernova last night! This one is in the constellation of Gemini (The Twins).*

*I got a notification of a transient from the ASASSN system and it was overcast in Ohio. Luckily I've been given the opportunity to do remote observing from the great folks at SkyPi Remote Observatories in NM so this was the perfect time to do it."*

- The links for the official announcements and discovery image.  
ATel's announcement: <http://www.astronomerstelegam.org/?read=8784>  
IAU's Discovery Certificate: <http://wis-tns.weizmann.ac.il/object/2016asf/discovery-cert>  
Discovery image: <http://www.astronomy.ohio-state.edu/.../follo.../asasn-16cs.png> "

<http://www.astronomerstelegam.org/?read=8784>

- ***Providing Fiber Optic Ethernet to Remote Observatories enables more astronomers and discoveries!***

# *SkyPi Online Observatory*

## *SkyPi*

- *Remote instrument operation*
- *Image capture, storage and transport*
- *Satellite Internet is provided for remote astronomers*
- *Western University Ottawa Center for Planetary Science and Exploration uses SkyPi*



*SkyPi consist of an observatory campus comprised currently of 4 observatories pictured here. Clients rent pier space and service for their telescopes operated remotely over the internet. Three additional observatories are planned next year at the site.*





# Remote Astronomy Challenges



## What needs to be solved?

### Issues

- Rural regions where astronomy science value is the greatest, typically can not support commercial broadband economics
- Presently rural DSL or Satellite can't meet most remote observatory requirements
- Wireless solutions often leads to increased RFI harming radio observations

### Solution

- Develop an Astronomers Network Cooperative formed of optical and radio astronomers to garner local government support to develop fiber optic pathways from remote rural locations to internet exchanges.



# Astronomers Network Cooperative Mission



- Increase Rural broadband Ethernet availability to serve more remote observatories for both private, academic and government astronomers.
- Entice more eyes on the skies — means more discoveries.
- Promote and establish optical ethernet broadband connectivity in remote regions where dark skies and radio quiet regions still exist.
- Assist rural communities to respect and protect dark skies and radio quiet regions.
- Determine application processes that provide fair access, timely processing and ensures priority access for astronomy resource development.
- Develop project structure that encourages local work force development and economic engagement.



# Take Action



- I am seeking astronomers and their advocates interested in exploring the formation of a Astronomers Network Cooperative organization.
- Create an Astronomer Network Cooperative organization to promote, broadband internet services for Astronomy Science locally which provides world-wide access to dark skies without harmful population growth in remote and rural regions.
- Join me in advocating for Astronomy Broadband internet endeavors locally and nationally.
- To stay informed about my efforts to develop more access to astronomical resources through rural optical Ethernet networks and to form an Astronomy Network Cooperative, a sign-up sheet and business card drop box has been provided at the door.
- I will send out an email newsletter to interested parties with information on our activities in gathering support to serve Astronomers and their future discoveries.
- I can be contact through my website. [www.greenlionservices.com](http://www.greenlionservices.com)