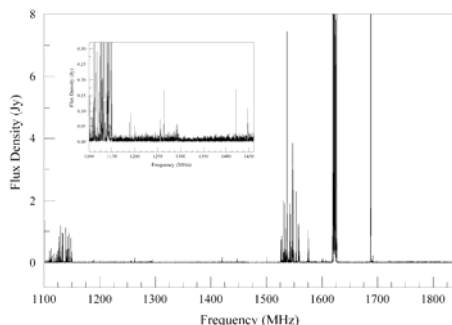


# Dark Skies are a Universal Resource. So Are Quiet Skies!

Ronald J Maddalena, and Sue Ann Heatherly  
National Radio Astronomy Observatory  
Green Bank, WV

## In the Beginning: The Quiet Skies Project



Where's the astronomical signal in this typical radio spectrum? Everything in this plot is RFI except for the tiny line at 1420 MHz which arises from hydrogen in our Milky Way. Yet, this line is one of the strongest radio spectral lines and one of the most important astronomical probes of the interstellar and extragalactic media.

In the same way that man-made light obscures our night sky and blinds ground-based optical telescopes, man-made radio signals effectively blind radio telescopes as well.

NRAO developed the Quiet Skies project to increase awareness of radio frequency interference (RFI) and radio astronomy in general by engaging students in local studies of RFI.

To do that we created a sensitive detector which measures RFI. We produced 20 of these, and assembled kits containing detectors and supplementary materials for loan to schools. Students conduct experiments to measure the properties of RFI in their area, and input their measurements into an NRAO data base.

The student project was funded by a NASA IDEAS grant.



Students from Linwood Holton Governor's School measure RFI in Green Bank, WV.

## IYA Goals

The Quiet Skies Project is a component of the Dark Skies Awareness Project.

Our aim is to promote a greater awareness of radio astronomy and the need for Quiet Skies.

Our goals are to:

- Manufacture 500 Quiet Skies Detectors;
- Launch a loan program to science centers, and museums around the world;
- Measure RFI at 10,000 locations by the end of IYA;
- Produce an interactive map- the radio equivalent of the "Earth at Night" image!



The Earth at Night image dramatically illustrates our vanishing dark skies.

## Nuts and Bolts of the Detector

The Quiet Skies Detectors operate over a frequency range of 800-1700 MHz. This frequency range is of interest to radio astronomers. Pulsars, neutral hydrogen, and star formation regions can all be detected within this range.

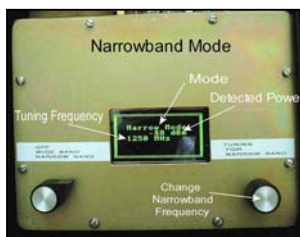
The QS Detector can be operated in wide-band mode and narrow-band mode. When in wide-band mode, the detector acts much like a optical light meter in that it reports the total amount of power between 800 and 1700 MHz. When in narrow-band mode the detector can be tuned in frequency. This allows the user to determine the frequency of an RFI signal to within 5 MHz. The frequency of an RFI source is a clue to what it is.

The detector and its antenna is securely contained within a small, plastic attaché-like case. The case is supplied with a tripod mounting plate for accurate field measurements.



Views of the Quiet Skies Detector.

Below, a zoomed view of the controls, and display.



## The Web Site

Those who use the Quiet Skies Detectors will be asked to enter RFI data into the NRAO database. The database is accessed from the Quiet Skies web site.



Above, the Quiet Skies homepage. At right, the narrowband data entry page.

These RFI data will be used to create an interactive map of the Earth.

## Quiet Skies Lite

A cheap AM radio is a pretty good RFI detector. With it you can audibly detect RFI from small motors, computers, remote control devices, light switches... most anything that emits broadband RFI.