

# Science

## About the Society of Amateur Radio Astronomers

Stanford Solar Center  
and  
Society of Amateur Radio Astronomers

A network of space weather monitors (the original SID) have already been deployed to over 300 students and teachers around the world through the IHY International Education and Public Outreach Program. These units along with the new SuperSID will provide students, scientists and teachers with an understanding of the effects of solar activity and thunderstorm phenomena on the Earth's ionosphere. This SID network focuses on detection of solar-induced ionospheric disturbances. A centralized database allows access to all participants.



The original SID Monitor

The Society of Amateur Radio Astronomers (SARA) is an international society of dedicated enthusiasts who teach, learn, trade technical information, and do their own observations of the radio sky. This organization is a scientific, non-profit group founded for the sole purpose of supporting amateur radio astronomy. SARA was organized in 1981, and today has hundreds of members worldwide. The group consists of optical astronomers, ham radio operators, engineers, teachers and non-technical persons. Many of our members are new to the field, and membership is extended to all who have an interest in radio astronomy. SARA members are committed to bringing science and radio astronomy to the classroom.



Bringing hands-on science to Developing Nations and students around the world.

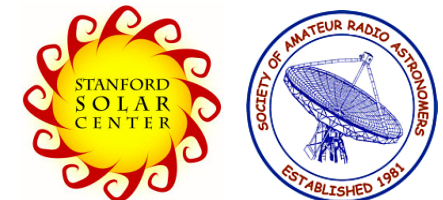
## Educational Resources

Curriculum materials designed and tested by Master Teachers have been developed by Chabot Space & Science Center in Oakland, CA USA. A centralized database is being supported at <http://sid.stanford.edu/database-browser/> for sharing data. A user group is available for communications amongst teachers, students and researchers worldwide. <http://tech.groups.yahoo.com/group/SuperSID/>. Classrooms will be provided with access to a network of SARA mentors to allow for discussion and assistance with data, problems and research.

### Supporters of the SID & Super SID Monitors:



Plus teachers, students, radio enthusiasts and scientists around the world!



<http://sid.stanford.edu>  
[www.radio-astronomy.org](http://www.radio-astronomy.org)



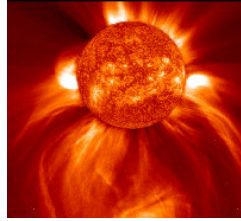
## The IHY, the UN and the Monitors



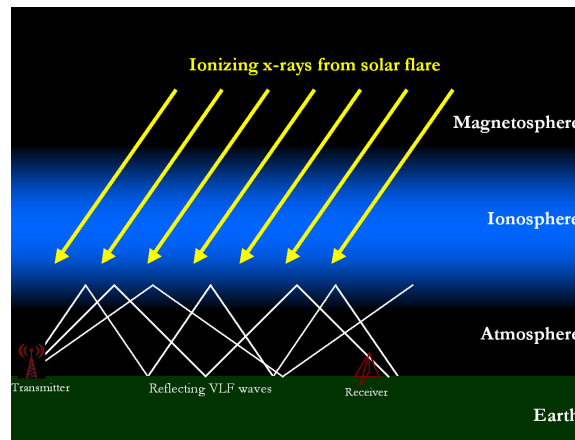
Stanford's Solar Center in conjunction with the Space, Telecommunications and Radioscience Laboratory and local educators developed the original Space Weather Monitors that students still use to track solar- and lightning-induced changes to the earth's ionosphere. Through the United Nations Basic Space Science Initiative (UNBSSI) and the IHY International Education and Public Outreach Program monitors have been deployed to countries of the world.

Stanford's Solar Center and the Society of Amateur Radio Astronomers (SARA) are continuing the UN/IHY initiative with the design and distribution of the SuperSID. Requests for monitors can be sent to [supersid@radio-astronomy.org](mailto:supersid@radio-astronomy.org)

## Monitoring the Ionosphere



Earth's ionosphere reacts strongly to the intense X-ray and ultraviolet radiation released by the Sun during solar events and by lightning during thunderstorms. Students track these sudden ionospheric disturbances by using a pre-amp and sound card to monitor the signal strength from distant very low frequency (VLF) transmitters, signals sent by nations to communicate with their submarines. Data show unusual changes as the waves bounce off the ionosphere during these disturbances.



## SuperSID: the Next Generation

The original SID was designed to monitor a single VLF radio frequency. The newest SID monitor utilizes a simple pre-amp to magnify the VLF radio signals which are then fed into a high definition sound card. This design allows the user to monitor and record multiple frequencies simultaneously. The user determines which signals are strongest at their location and sets the configuration file to collect data for those frequencies. Users send data every 24 hours to the Stanford data repository where students, teachers and scientists can analyze and compare data.



Science is fun and exciting and opens the door to endless possibilities for students around the world. ALL students deserve the opportunity for hands-on access to real scientific data.