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CARMA T-SHIRTS
\$10

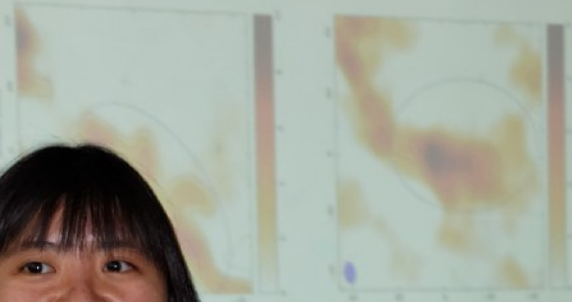
Preparation for
the 2008, 2009, and 2010







Starless Cores in Orion ★



Evolution of dust and gas at the very early stage
essentially will form stars.
Kinematics of starless cores can be
the mechanism of star formation.



CAUTION
DO NOT TOUCH
OR REMOVE
OR REARRANGE
OR REWIRE
OR REWIRE

Starless Cores
in Orion
February 2012

987

What does the 'Correlator' do?

All the antennas are pointed at the same radio source location in the sky.

The receivers on the telescopes are tuned much like a car radio, but they receive signals at 1000 times higher frequencies.

The signals received by the telescopes are like the 'static' or noise you hear between radio stations. This noise is caused by natural processes such as the motions and vibrations of molecules (which produces spectral lines) and the motion of electrons in magnetic fields (which produces noise over a wide range of frequencies).

The antenna receiver outputs analog of the radio source signal corrupted by 'noise' from the receiver electronics. The receiver noise is different for each antenna and is thousands of times larger than the signal we are trying to measure.

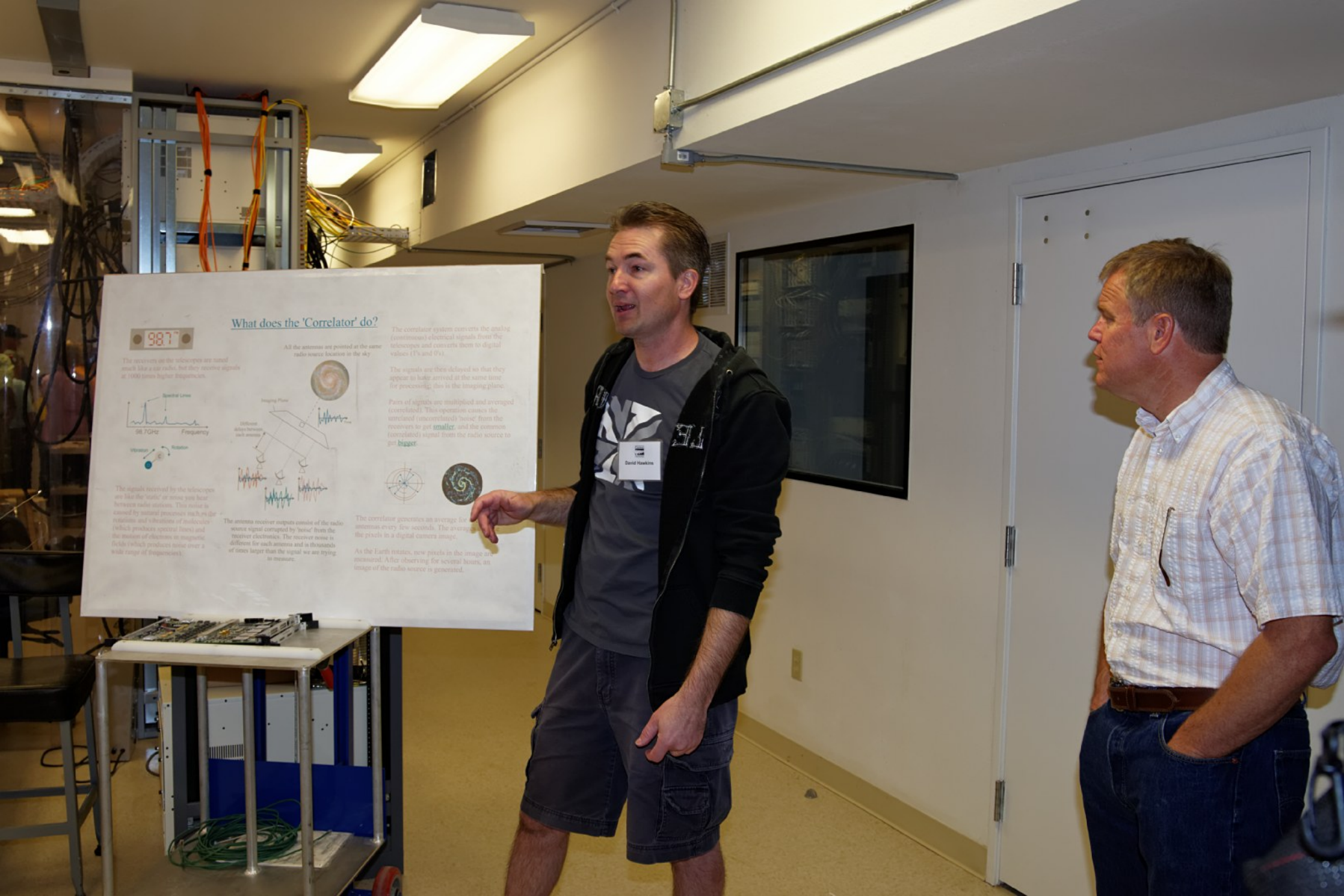
The correlator system converts the analog (continuous) electrical signals from the telescopes and converts them to digital values (1's and 0's).

The signals are then delayed so that they appear to have arrived at the same time for processing; this is the imaging plane.

Pairs of signals are multiplied and averaged (correlated). This operation causes the unwanted (uncorrelated) 'noise' from the receivers to get smaller, and the common (correlated) signal from the radio source to get bigger.

The correlator generates an average for each antenna every few seconds. The average of the pixels in a digital camera image.

As the Earth rotates, new pixels in the image are measured. After observing for several hours, an image of the radio source is generated.





Richard Lane

CARMA
Chandra Array Radio
Magnetometer

COAX
SMA SMA
SMA SMA









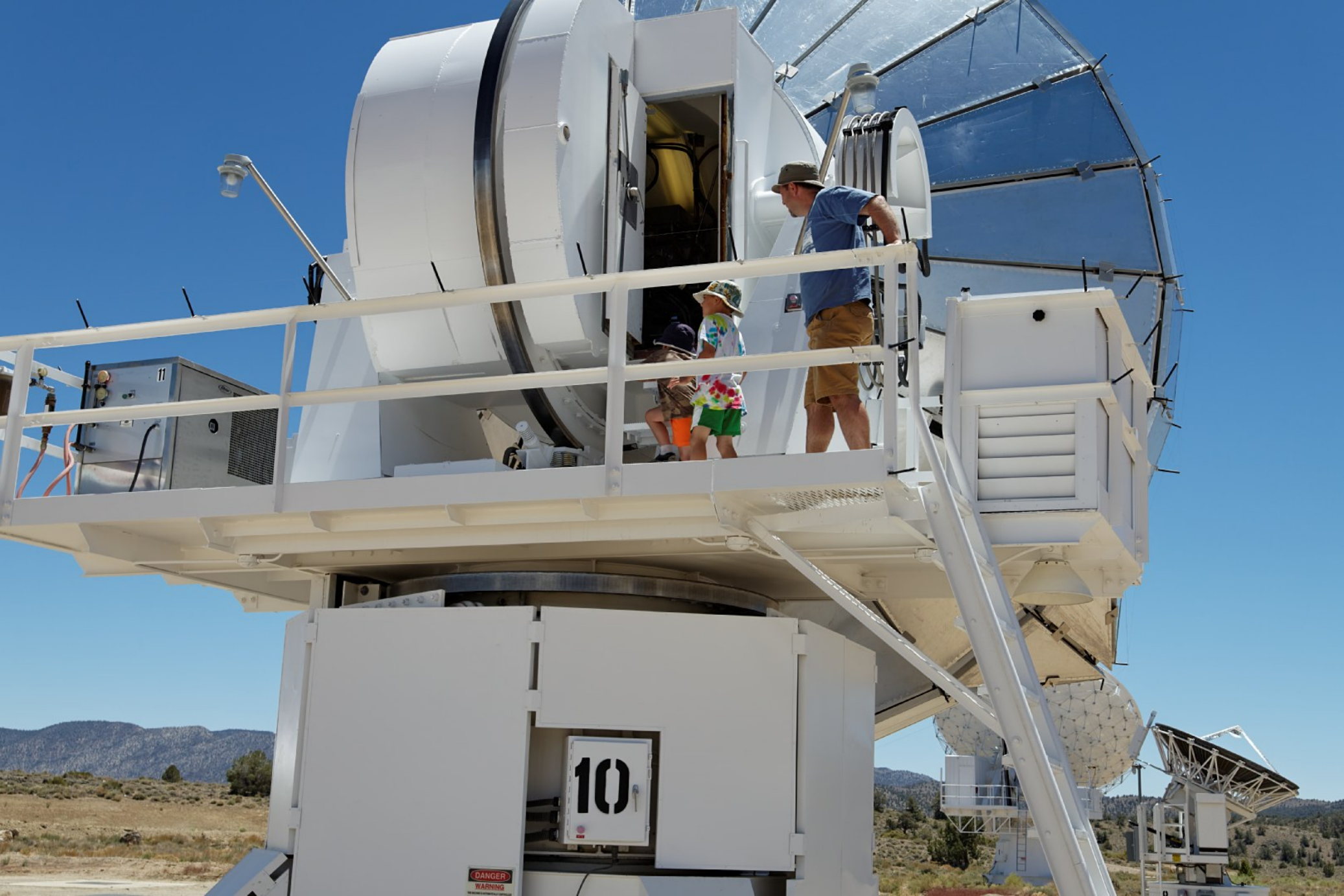












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DANGER
WARNING




















James Lamb





High Resolution
Star-Forming Clusters
CMCs in Spiral Galaxies: NGC 5446

Observations of the CMCs in NGC 5446 were made with the CARMA array. The images show the structure of the CMCs and their location within the galaxy. The maps show the distribution of the CMCs in the galaxy.

CARMA Instrumentation

Specifications

Parameter	Value
Frequency Range	230 - 245 GHz
Bandwidth	100 MHz
Resolution	1.5 arcmin
Dynamic Range	100 dB
Integration Time	1000 s
System Temperature	200 K
Flux Density	0.1 Jy
SNR	100
Beam Size	1.5 arcmin
Pointing Accuracy	0.1 arcmin
Calibration Accuracy	1%
Bandwidth	100 MHz
Resolution	1.5 arcmin
Dynamic Range	100 dB
Integration Time	1000 s
System Temperature	200 K
Flux Density	0.1 Jy
SNR	100
Beam Size	1.5 arcmin
Pointing Accuracy	0.1 arcmin
Calibration Accuracy	1%

LO & H Switches

1000 dual polarization receivers

Coating

Technical diagrams and photographs showing the physical components of the CARMA instrumentation, including the receivers and the antenna structure.



CARMA

COMBINED ARRAY FOR RESEARCH IN MILLIMETER-WAVE ASTRONOMY

A large black curved banner featuring the CARMA logo and title. Below the title is a circular illustration showing the layout of the CARMA antenna array in a desert landscape.





CAUTION
THIS ROOM IS PROTECTED
BY AN INDOOR USED FIRE
SUPPRESSION SYSTEM
DO NOT ENTER WHEN
LIGHT IS ACTIVATED

VISITORS

phone

address

Mary Carter

CARMA T-SHIRTS





CAUTION
Do not touch the
equipment unless
you are instructed
to do so.

CARMA T-SHIRTS

THE BEATINGS
WILL CONTINUE
UNTIL MORALE
IMPROVES!



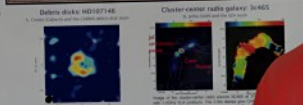






Science

outflows from MCG 2-9-9
Debris Disks HD52297



Cluster-center radio galaxy: 3c 463
Debris disks HD187148
Debris Disks HD52297
SZ Effect from z-1 Galaxy Clusters
Organic Molecules in Orbits



MA Instrumentation



Upgrade Temperature
MA Instrumentation

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