

Doppler radar is a key forecasting tool

As a hurricane approaches the coast or thunderstorms threaten to become severe, you're likely to hear about what Doppler radar shows. Doppler refers to the principle the Austrian scientist Christian Doppler discovered in 1842. Doppler worked out his ideas using sound waves, long before radio, much less radar, was invented.

But the same principle applies to radar's radio waves and to light arriving from distant stars. The basic principles behind radar and its Doppler version are the following:

- 1 the antenna sends out radio waves;
- 2 raindrops and other objects in the air reflect radio waves;
- 3 objects moving toward the antenna increase the waves' frequency;
- 4 objects moving away decrease the waves' frequency.

During the 1980s and early 1990s, the National Weather Service installed Doppler radars around the USA. In addition, some television stations have their own Doppler radars, while others use images from the NWS radars.

All weather radars send out radio waves from an antenna. Objects in the air, such as raindrops, snow crystals, hailstones or even insects and dust, scatter¹ or reflect some of the radio waves back to the antenna. All weather radars, including Doppler, electronically convert the reflected radio waves into pictures showing the location and intensity of precipitation.

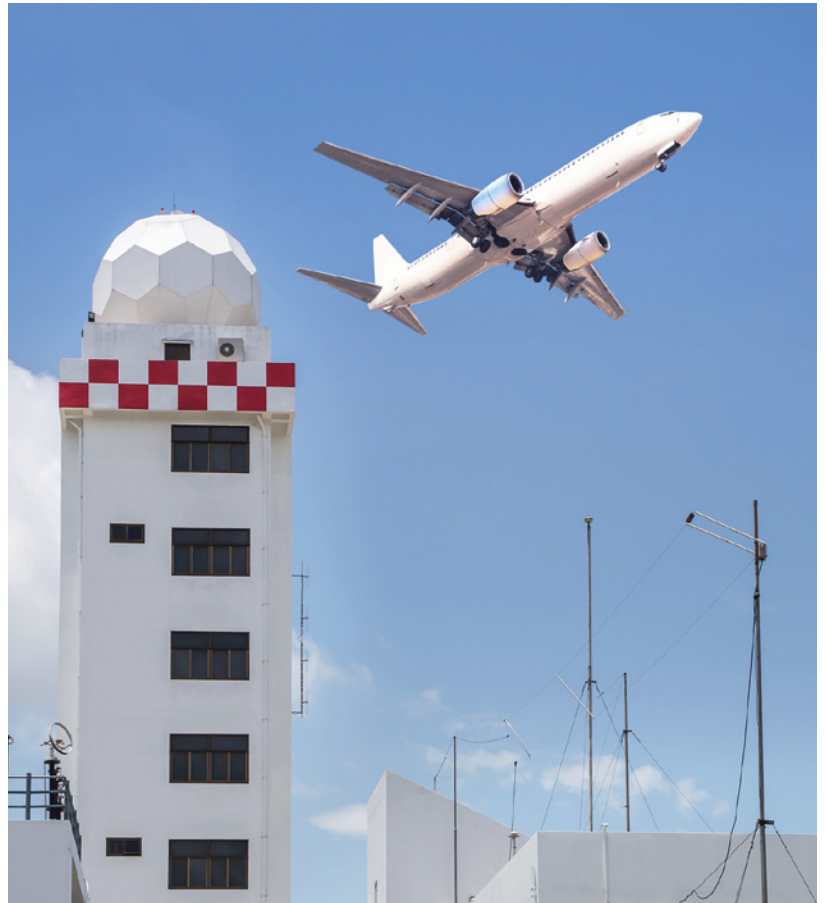
Doppler radars also measure the frequency change in returning radio waves.

Waves reflected by something moving away from the antenna change to a lower frequency, while waves from an object moving toward

the antenna change to a higher frequency. The computer that is a part of a Doppler radar uses the frequency changes to show directions and speeds of the winds blowing around the raindrops, insects and other objects that reflected the radio waves.

Scientists and forecasters have learned how to use these pictures of wind motions in storms, or even in clear air, to more clearly understand what's happening now and what's likely to happen in the next hour or two.

Adapted from *usatoday.com*



ACTIVITIES

- 1 Explain how Doppler radars work.
- 2 Scan the text and find the English equivalents of the following Italian words.
 - 1 Temporalì
 - 2 Onde sonore
 - 3 Gocce di pioggia
 - 4 Aumentare
 - 5 Diminuire
 - 6 Chicchi di grandine
 - 7 Meteorologi