

Mysterious energy discovered in thunderclouds

By *Arelis R. Hernandez*

ORLANDO, Fla. — Central Floridians are no strangers to violent thunderstorms, living in the lightning capital of the country.

But now scientists have discovered an exotic and dynamic form of energy lurking in the thunderclouds above: dark lightning.

Scientists at the Florida Institute of Technology on the Space Coast are traveling the world explaining the mysterious bursts of energy in the atmosphere during lightning storms that emit little visible light.

According to scientist Joseph Dwyer and his colleagues, space telescopes – looking for high-energy bursts from solar flares, black holes and exploding stars – detected strange, bright bursts but had no idea where they originated.

The phenomenon occurs high in the atmosphere at nearly the same altitude as commercial airline flights. The radiation dark lightning produces is about 100 times more potent than an X-ray.

“What’s kind of cool is that what we’re talking about sounds like science fiction – but this stuff is really happening inside thunderstorms,” said Dwyer, who spoke with the Orlando Sentinel from Vienna, where he presented his research at a meeting of the European Geosciences Union. “It’s happening right over our heads.”

Normal lightning occurs when clouds pregnant with positive and negative charges build up and create an electric field. When those charges separate, they discharge huge amounts of energy suddenly and cause a hot, bright, incandescent spark.

It’s like rubbing your feet on a rug and touching a metal doorknob. Zap!

Dark lightning is another kind of discharge humans can’t see. If our eyes were sensitive enough, we might see a bluish-purple glow emanating from the clouds.

An electric field emerges just as it does for lightning. But under the right conditions, dark lightning produces a kilometerwide explosion of electrons and their antimatter equivalent, positrons – the power source for starship Enterprise.

Those particles collide with air molecules at nearly the speed of light, shooting streams of gamma rays and radio waves into space.

If a plane is flying through a thunderstorm, dark lightning could produce radiation comparable to what a human receives during a full body CT scan or 10 chest X-rays.

It can be hazardous, but most pilots avoid thunderclouds at all costs. Dwyer says it’s not worth losing sleep over: The likelihood of getting a dosage of dark lightning radiation is low.

“This is not a reason to avoid flying,” Dwyer said.

Dark lightning is less frequent but more powerful than regular lightning.

The continuous collisions of positrons, electrons and air molecules emitting gamma rays mean thunderstorms act like natural particle accelerators.

Scientists use particle accelerators in their research to create electromagnetic fields to find answers to basic questions about the structure and origins of the universe. An older television’s cathode-ray tube – which enables you to see images on the monitor – is an example of one.

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Because scientists have only begun to understand the phenomenon, there is still a lot they don't know.

Most of the dark lightning has been spotted in the tall storm clouds of the tropics – but that doesn't mean it's not happening frequently in Central Florida.

The region is a nucleus of bolt activity because it sits in the center of a long, narrow peninsula with warm water on either side. Easterly and westerly sea breezes collide to create powerful storms.

With more research, the Orlando metropolis could turn out to be a major hub of dark lightning energy.

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