

# **SOUTH ATLANTIC ANOMALY**

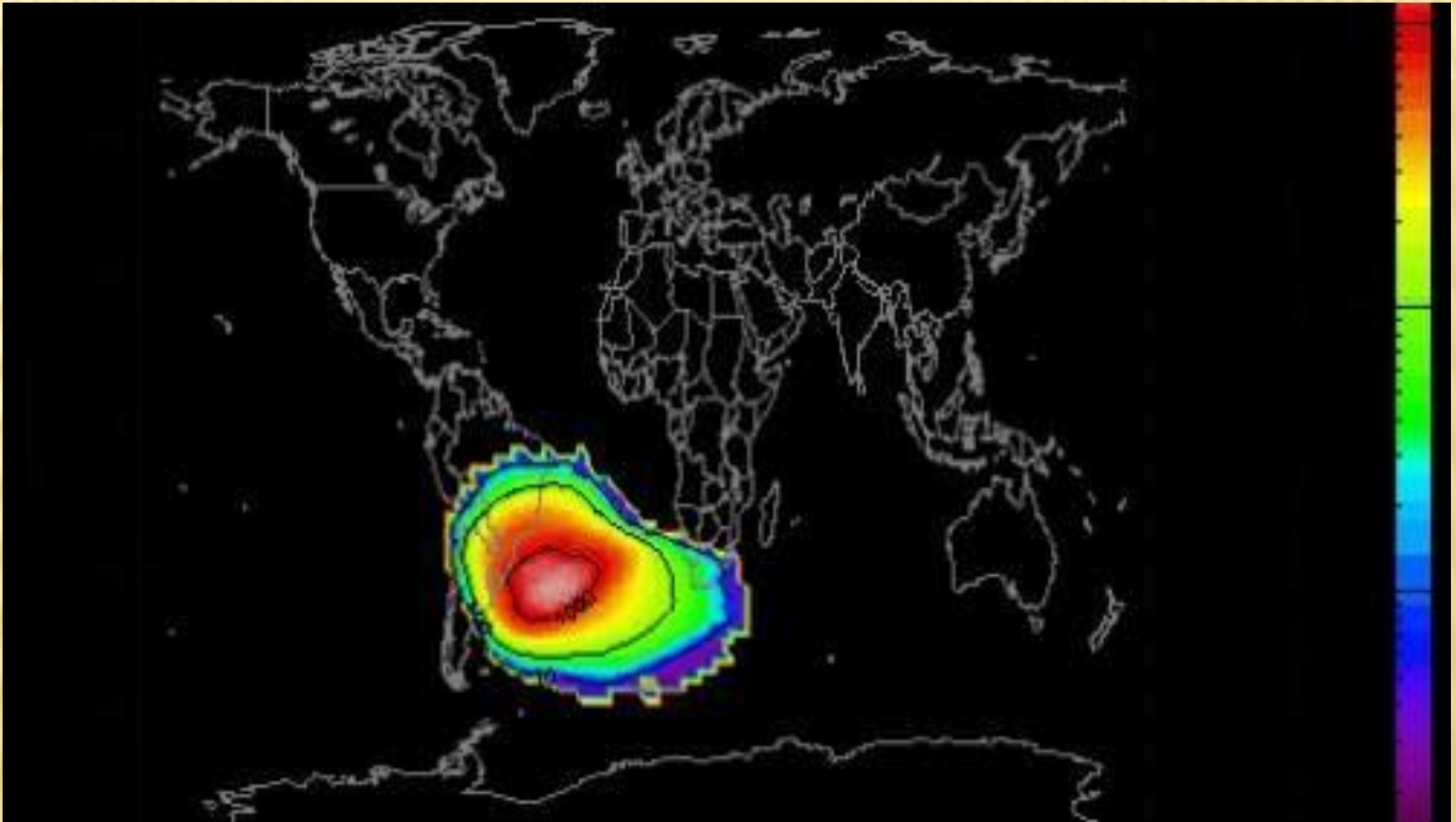
Reno, NV

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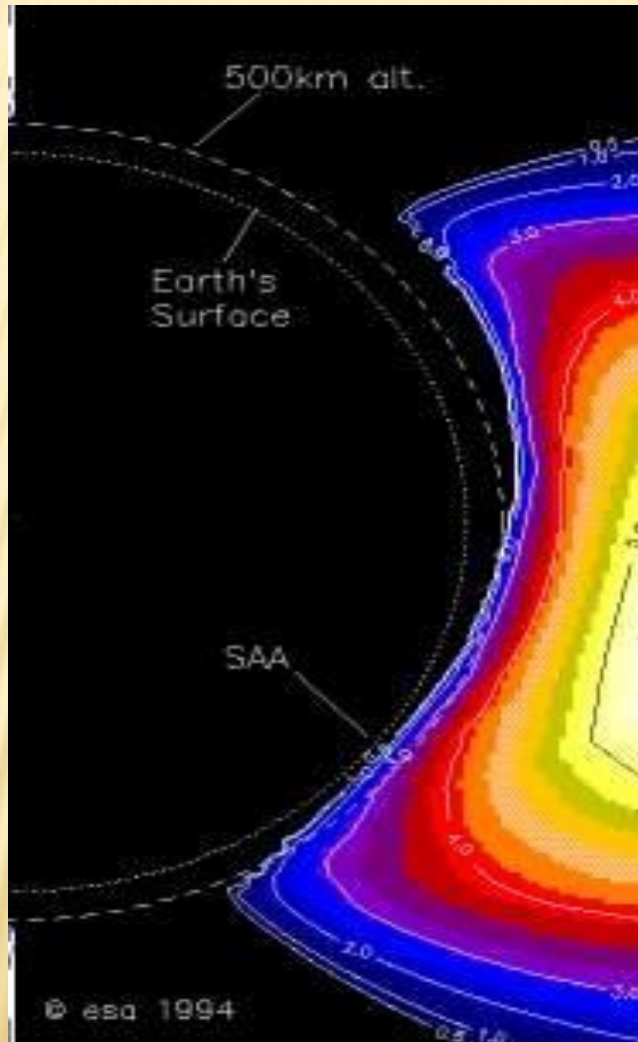
- ✖ The **South Atlantic Anomaly**, is a region where the Earth's inner **van Allen radiation belt** makes its closest approach to the planet's surface. The result is that, for a given altitude, **the radiation intensity is higher over this region than elsewhere. Brazilians are blessed indeed.**
- ✖ The Anomaly in the radiation belt results from the fact that the planet's magnetic field is not perfectly aligned with its geographic center and poles. Which means the magnetic field is slightly stronger in the North, and moves around the geographic poles, leaving the area around Brazil and the South Atlantic closer to the radiation belts.
- ✖ Fortunately, **the effects of it over humans on the surface of the planet are not significant.** Unfortunately, **it's very relevant to orbiting satellites** — the Hubble Space telescope does not take observations while passing through the South Atlantic Anomaly, for instance. **Satellite failures** are much more common in this stronger radiation zone.

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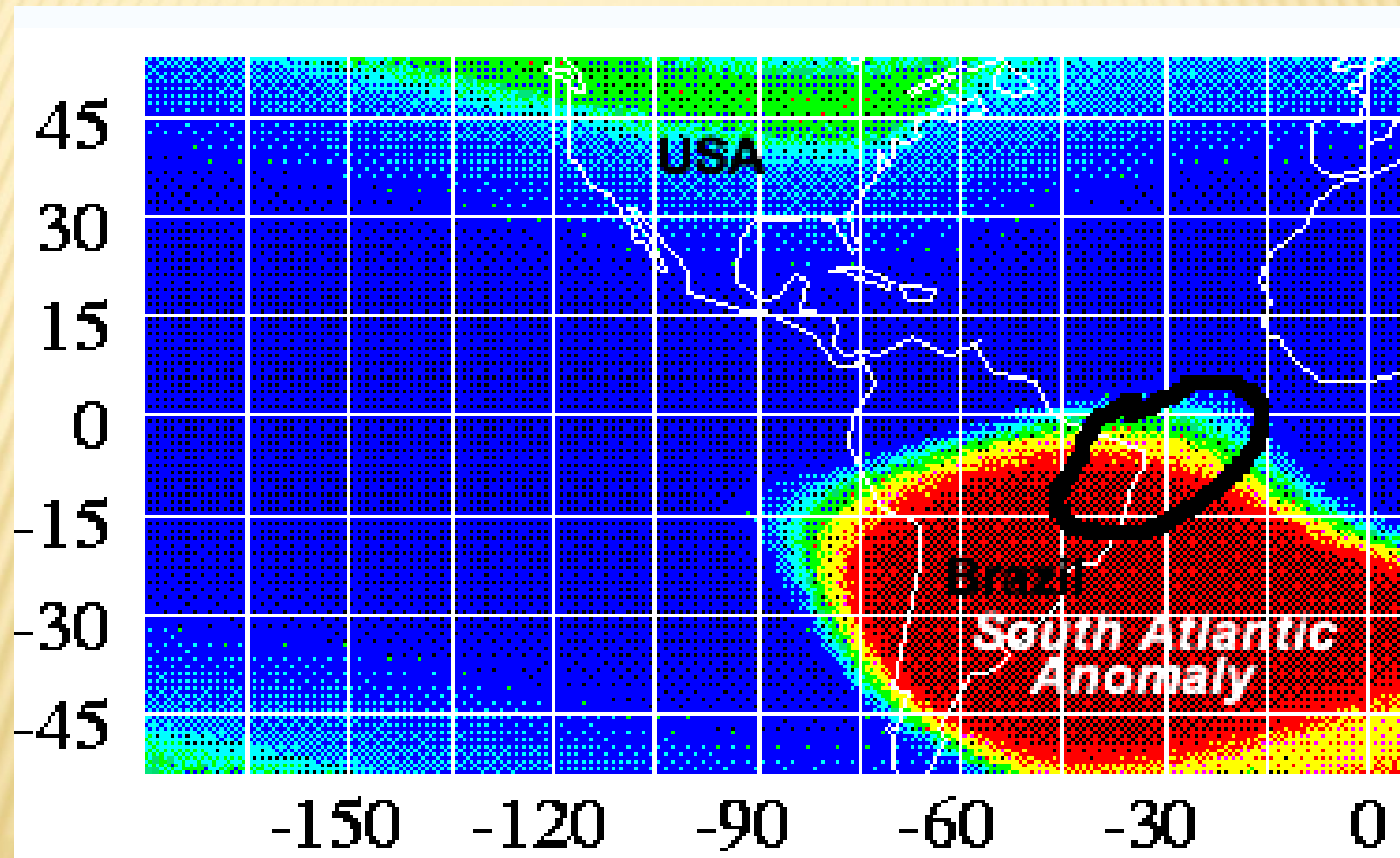
- ✖ It also affects satellites with humans inside, like the International Space Station. Light Flashes, thought to be produced by radiation directly stimulating the retina of astronauts, are reportedly more common when they are flying through the zone.
- ✖ As the Anomaly is due to the Earth's magnetic field, and since it's always moving — including several complete reversals — it probably danced around the planet for the past billion years. It's curious indeed that **such a “special area” would even exist**. And right now, **it's Brazilian**.

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- ✖ **Air France 447 electrical problems and the South Atlantic Anomaly**
- ✖ The Bermuda Triangle and missing aircraft may seem like science fiction, but there is a well documented region off of the coast of Brazil that contains highly charged particles. This area is known as the South Atlantic Anomaly and is avoided at all costs by orbiting satellites. NASA satellites that do travel in the region are shut down, or go into SAFE mode to avoid damage while passing over the Atlantic between Brazil and Africa.
- ✖ The electrical field around earth protects us from cosmic rays. There are two bands that trap highly charged particles circling the earth. The protons trapped near the surface is in this region called the Van Allen Belt. This radiation can cause all sorts of malfunctions in spacecraft electronics. In fact, the Geiger counter used to measure cosmic rays on Explorer 1 in 1958 stopped functioning because it was overloaded by radiation!



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- ✘ So what is the connection to Air France flight 447? This is where highly technical science could put some to sleep. While this flight path is used by commercial pilots without incidence daily, there is the possibility that one of these tropical thunderstorms tapped into the electric field nearby.
- ✘ The Inter Tropical Convergence Zone is known for some of the most violent thunderstorms on the planet. With cloud tops over 50,000 feet and violent updrafts of 100 mph, there is a tremendous amount of electricity generated. Commercial pilots say that lightning can be constant in these storms.
- ✘ Could flight 447 have been affected by a rare sequence of events including a direct lightning strike, extreme proton charge from the South Atlantic Anomaly, and then left defenseless as the storm and G-Forces in the violent up and downdrafts tore the fuselage apart?



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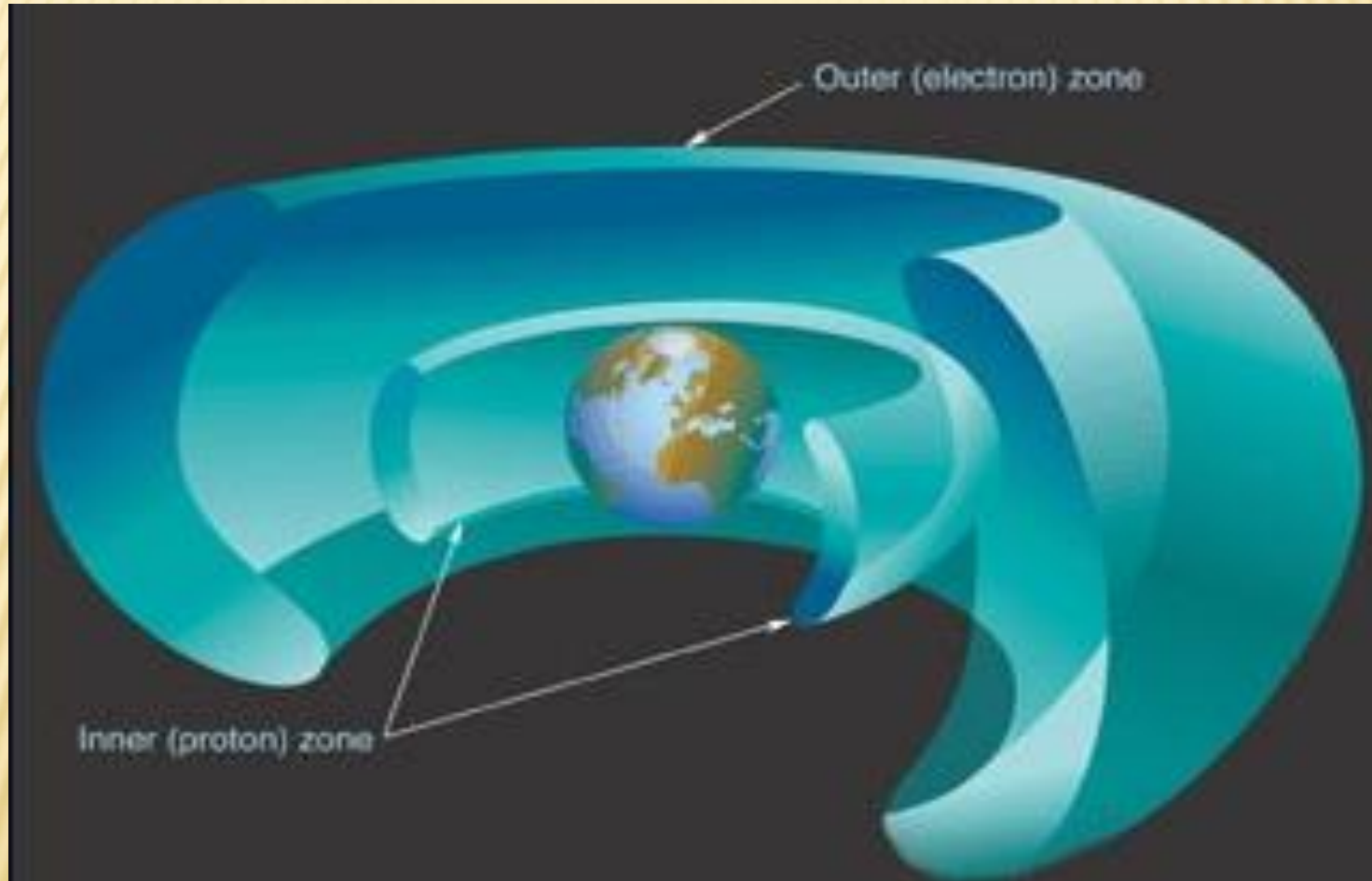


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- ✖ *United Airlines reported high frequency (HF) communications losses and solar radiation storms which caused planes to be diverted to less dangerous routes. Rerouting and general delays are costly to the airlines. One example of that was a storm that caused a flight to be diverted from a polar route, requiring additional fuel at Tokyo and extending the flight by 5 hrs 30 min.*
- ✖ *During another period, 25 flights were flown on less than optimal polar routes due to HF communications problems. Northwest Airlines diverted a Detroit - Beijing flight to a non-polar route due to both HF communications problems (radio blackout) and a solar radiation storm, forcing an unscheduled stop at Fairbanks for fuel. This route change resulted in an approximately 3 hour delay and \$100,000 cost to NWA, plus the inconvenience and loss attendants upon disrupting the travel of passengers.*
- ✖ *The Director of Flight Operations of Continental Airlines reported that they diverted their daily flight for the second day in succession based on the S3 level of solar radiation storm. The direct impact was 2 hours of extra flight time and additional associated costs.*



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