Lightening and Thunderstorms

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Lightning

- - lightning is a sudden electrostatic discharge
- - occurs between electrically charged regions of a cloud:
- - called intra-cloud lightning or IC;
- - between two clouds - CC lightning;
- - or between a cloud and the ground - CG lightning;

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- - charged regions in the atmosphere temporarily equalize themselves through this discharge
- - referred to as a strike if it hits an object on the ground,
- - and a flash, if it occurs within a cloud;
- - occurs when differently-charged objects are brought close together
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Lightning

Lightning - What do we know about it

Lightning - Thunder Storms

Some examples

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- - the storm clouds are charged like giant capacitors;
- - the upper portion of the cloud is positive and the lower portion is negative;
- - how the cloud acquires this charge is still not agreed upon within the scientific community,
- - but the following description provides one plausible explanation;

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- - in the process of the water cycle, moisture can accumulate in the atmosphere;
- - this accumulation is what we see as a cloud;
- - clouds can contain millions upon millions of water droplets and ice suspended in the air;
- - as the process of evaporation and condensation continues,
- - these droplets collide other moisture that is in the process of condensing as it rises;

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- - the rising moisture may collide with ice or sleet that is in the process of falling to the earth or located in the lower portion of the cloud;
- - the importance of these collisions is that electrons are knocked off of the rising moisture, thus creating a charge separation;
- - the newly knocked-off electrons gather at the lower portion of the cloud, giving it a negative charge;
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- - beyond the collisions, freezing plays an important role;
- - as the rising moisture encounters colder temperatures in the upper cloud regions and begins to freeze,
- - the frozen portion becomes negatively charged and the unfrozen droplets become positively charged;
- - rising air currents have the ability to remove the positively charged droplets from the ice and carry them to the top of the cloud;

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- - the remaining frozen portion would likely fall to the lower portion of the cloud or continue on to the ground;
- - now we can begin to understand how a cloud may acquire the extreme charge separation that is required for a lightning strike;
- - when there is a charge separation in a cloud, there is also an electric field that is associated with the separation;

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Some examples

Atlanta Lightning

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JHB-thunder

lightning 2

light-3

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light-4

light-5

light-6

light-7

light-8

light-Miami

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light-nr-1

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Light Panorama

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Light Paris 1

light- Paris -2

light Vatican 3

lightning-vatican2

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Lightning versus - fw Australia

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Lightning - Greg McCown

Lightning

NOAA-lightning