Ultracapacitor vs supercapacitor

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Supercapacitors have been around since the 1950s, but it"s only been in recent years that their potential has become clear. Let"s take a look at these computer components that store energy just like batteries but use completely different principles.

Before we get to supercapacitors, it"s worth quickly explaining what a regular capacitor is to help demonstrate what makes supercapacitors special. If you"ve ever looked at a computer motherboard or virtually any circuit board, you"ll have seen these electronic components.

A capacitor stores electricity as a static electric field. This is the same thing that happens when you walk across a carpet in socks and build up an electric charge, only to discharge it when you touch a door handle. You were acting as a capacitor!

Inside a typical capacitor, you"ll find two conductors separated by an insulating material. Positive charge accumulates on one conductor and negative charge on the other. Thus, there"s an electrostatic field between the two plates. There are many different ways to design a capacitor, but they all have the basic components of two charge plates and an insulator (dielectric). The insulator can be air, ceramic, glass, plastic film. liquid, or anything else that"s bad at conducting electricity.

Capacitors have many uses in electronics. In computers and other digital systems, they make sure that information isn"t lost if there"s a momentary loss of power. They also act as filters to clean up electrical surges that might otherwise damage sensitive electronics.

Capacitors and batteries are similar in the sense that they can both store electrical power and then release it when needed. The big difference is that capacitors store power as an electrostatic field, while batteries use a chemical reaction to store and later release power.

Inside a battery are two terminals (the anode and the cathode) with an electrolyte between them. An electrolyte is a substance (usually a liquid) that contained ions. Ions are atoms or molecules with an electrical charge.

There"s also a separator within the electrolyte that only allows ions to pass through it. When you charge the battery, ions move from one side of the separator to the other. When you discharge the battery the opposite

happens. The movement of ions chemically stores electricity or turns that stored chemical energy back into an electric current.

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