

ENVIRONMENT

REPAIRING THE OZONE LAYER

A giant electrified curtain hanging far above Earth could help restore the planet's protective ozone layer, says plasma physicist Alfred Y. Wong of UCLA. His proposed curtain would neutralize chlorofluorocarbons (CFCs) that are destroying ozone.

In the atmosphere, chlorine atoms break off from CFCs and attack ozone molecules. Wong's idea is to give the chlorine atoms a negative charge, so they no longer react with ozone. In laboratory tests, the idea appears to work.

To negatively charge chlorine atoms

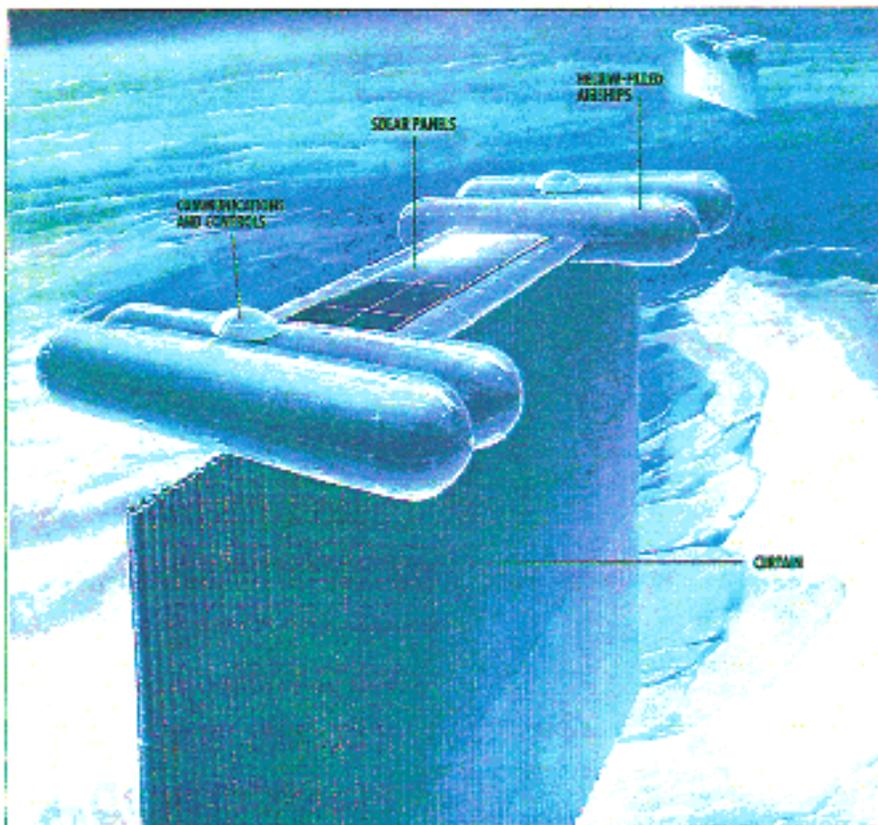
in the atmosphere, Wong proposes constructing massive wire curtains that would hang from blimps. Powered by solar panels, the curtains would spit out electrons to charge passing chlorine atoms. Once charged, the chlorine atoms could be collected on a second, positively charged curtain, or on a curtain doped with an element such as sodium that would bind with the chlorine to form salt.

Wong is also looking at cage-like designs made from wires or thin metal tubes. "Our objective is to make it as light as we can," he says.

The curtain or cage could be suspended in the stratospheric ozone layer. Or it could hang closer to Earth in the troposphere, where it would eliminate some CFC molecules before they drift high enough to threaten ozone.

Wong plans to build a small-scale curtain that will fly on NASA's SR-71 Blackbird research airplane. Sensors on the plane will take ozone measurements before and after the curtain is deployed. Another experiment may focus on repairing ozone holes created by rocket launches.

The task of removing chlorine atoms is not as difficult as it might seem, says Wong. There are relatively few of these atoms in the atmosphere, but each one can destroy as many as 500,000 ozone molecules.



This electrostatic curtain gives chlorine atoms a negative charge, rendering them incapable of destroying ozone molecules. The solar-powered, football-field-size curtain would be carried aloft by airships.

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