



# Ambient-Gas Plasma: A Sustainable Disinfectant Made From Electricity and Air

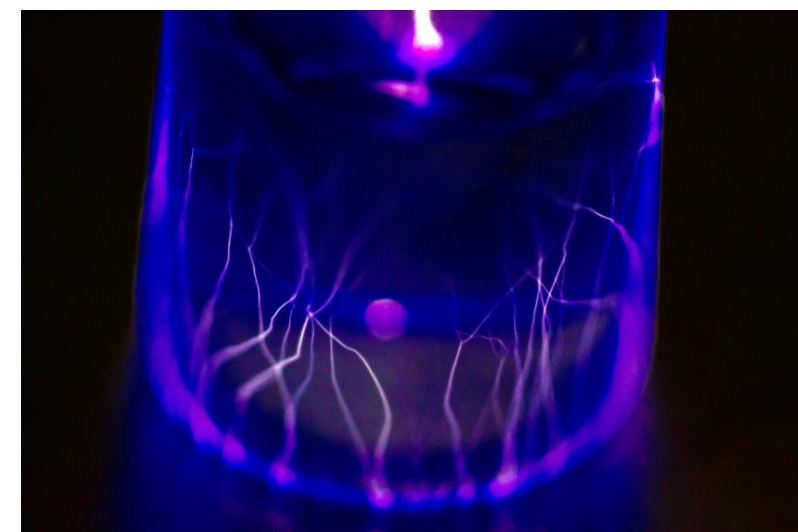
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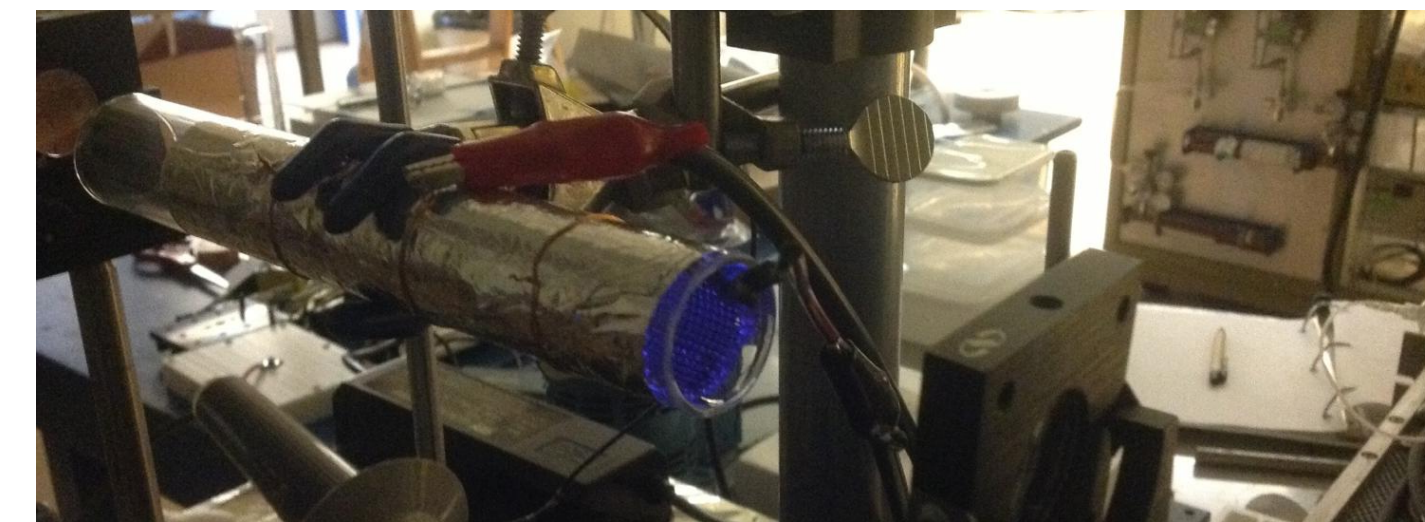
<http://graves-lab.cchem.berkeley.edu/agp/>

## What is Plasma?



Sometimes called the “fourth phase of matter,” plasma is a high-energy state similar to gas. We create plasma from air at atmospheric pressure and room temperature, which produces reactive compounds that are toxic to bacteria and other microorganisms.

## Designing a Prototype



Plasma disinfection works well in controlled lab conditions, but our current challenge is to translate our lab technology into a field-ready prototype. The prototype will be built out of cheap, robust materials that can be replaced locally. Plasma sterilization is well suited to low-resource settings because it requires only electricity and air to run.

## Potential Applications for the Developing World

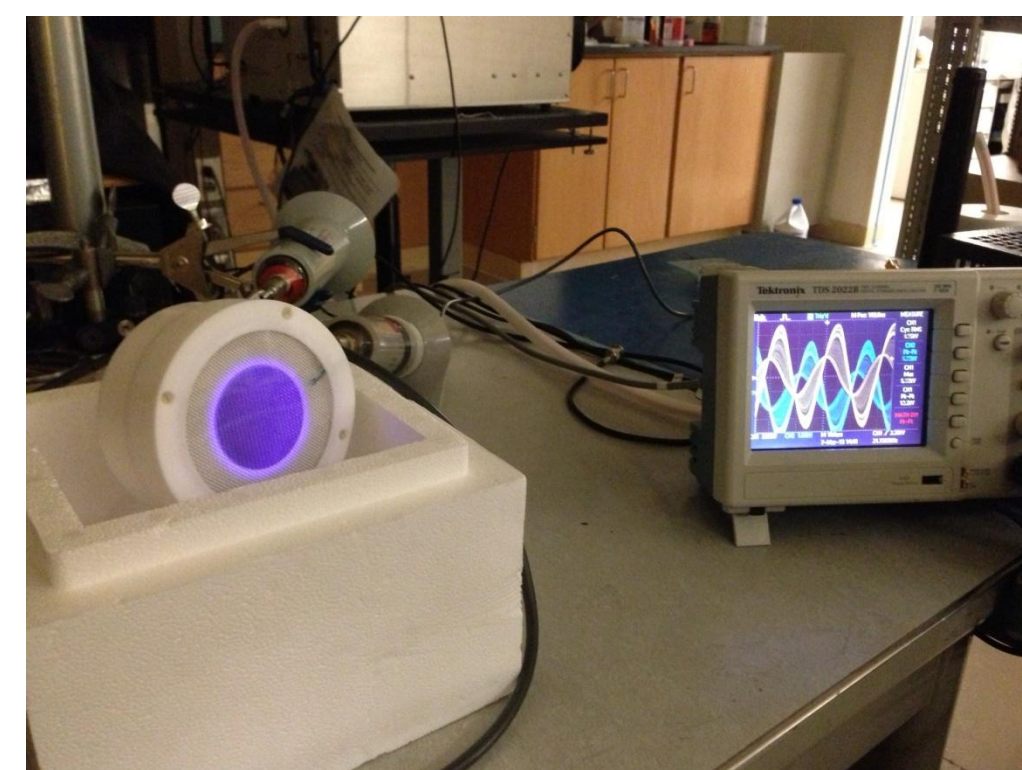
### Solar Suitcase

Our collaborators at WE CARE Solar have developed a portable energy source to provide lighting, communication, and medical support in low-resource areas. Excess solar energy can be used to power plasma-producing devices.



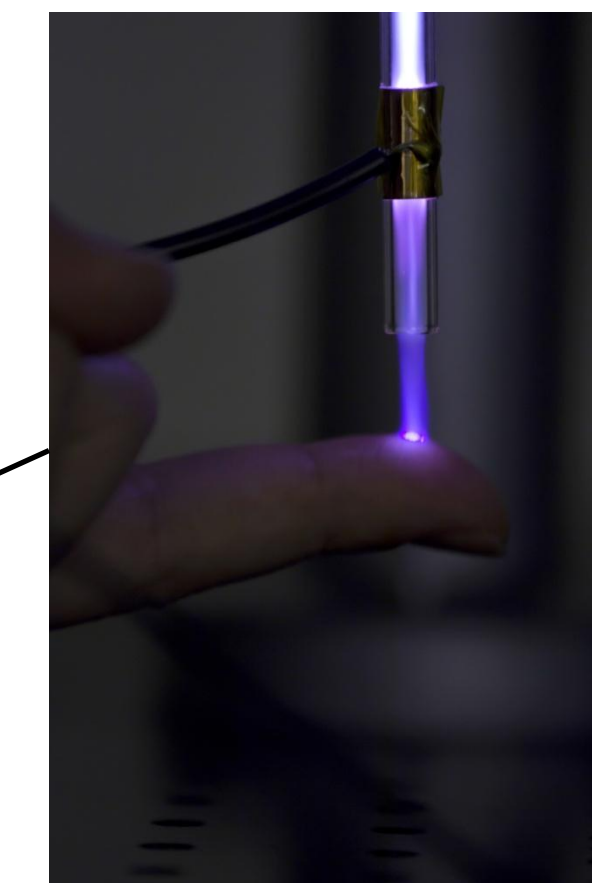
### Surface Disinfection

Plasma disinfects surfaces, including instruments, textiles, food, and medical devices contaminated with bacteria and other pathogens.



### Hand Hygiene

Hand washing is critical to preventing infections. Plasma can aid in skin antisepsis via direct surface disinfection or by creating antimicrobial water.



### Water Treatment

A major concern in the developing world is clean water for drinking and washing. Plasma can disinfect water in two different “modes,” either creating a persistent antimicrobial effect with nitrogen oxides, or using ozone for rapid decontamination.

