

NEWS | JUNE 13 2022

Plasmas show promise in solving health and environmental crises

Alane Lim



Scilight 2022, 241103 (2022)

<https://doi.org/10.1063/10.0011745>



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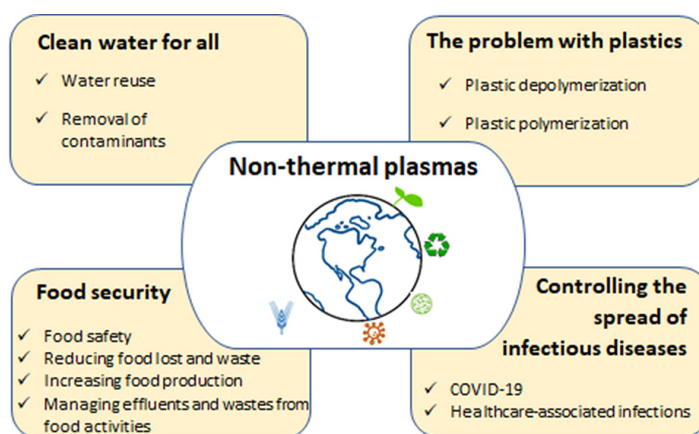
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Plasmas show promise in solving health and environmental crises

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Non-thermal atmospheric plasmas have the potential to address global environmental challenges.



The world faces many environmental challenges, such as climate change, the persistence of contaminants in drinking water, the growth of plastic waste, threats to food and water availability, and uncontrollable spread of disease. Foster and Garcia reviewed how atmospheric plasmas are being investigated as potential solutions to these problems, highlighting the science, the recent progress, and the technical challenges that lie ahead.

The authors hope their review will show how the plasma community is addressing these environmental issues and posing potential solutions using atmospheric plasmas. These plasmas can provide cost savings and greater control over chemical reactions when compared to conventional approaches in which reactions are driven thermally.

“This review discusses the use of nonthermal, atmospheric pressure plasma for a more efficient approach to control chemistry in liquid, solid and gas phases and highlights the range of environmental and health applications enabled through this approach,” author John Foster said. “Through the use of nonequilibrium chemistry one has greater control over reaction selectivity and energy cost by directing energy into channels to drive specific reactions.”

While the results are promising, the authors emphasize the results of plasma-driven reactions are not currently scaled to the size needed for practical, large-scale implementation. They hope readers will be inspired to research this problem of scalability.

“At this juncture, some effort should be placed on addressing the science and engineering of how we broadly can implement plasma solutions that make sense from a techno-economics point of view – and scale is key!” Foster said.

Source: “Promise of nonthermal plasmas in addressing emerging environmental and health problems: Present and future,” by John E. Foster and Maria C. Garcia, *Physics of Plasmas* (2022). This article is invited from Foster’s 2020 Ronald C. Davidson Award for Plasma Physics. The article can be accessed at <https://doi.org/10.1063/5.0083766>.

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