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Disruptive plasma approaches for tackling global challenges.

Abstract: Atmospheric pressure plasmas have been gaining traction. This is due to the range of applications with significant impact potential. We aim to exploit the non-equilibrium plasma environment, to enable solutions, that can contribute to a sustainable future, and a world-wide healthier society and economy. Low-temperature plasmas are non-thermal, non-ablative technologies possessing a non-equilibrium environment that can be produced through electrically energising a gas generating a rich reactive chemistry along with charged particles, electric fields and photons. Plasmas have a unique capability to locally deliver a dry reactive chemistry at ambient temperature, very precisely (on atomic scales), and equally well scalable for large area treatments. Through interrogating and analysing these plasmas, including the interfaces between phases e.g. plasma-gas and plasma-liquid, enable us engineer specific solutions. Applications in plasma medicine for cancer treatment and environmental applications in agriculture will be presented.