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Recent highlights in plasma science and applications

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Plasmas underpin many existing technologies and drive next-generation innovations. Non-equilibrium plasmas are a powerful medium for ionisation, excitation, dissociation, and bond modification, at solid surfaces, in liquids and gases. These processes produce an intriguing reactive environment, combining ions, electrons, reactive neutrals and photons. Atom-scale precision can be achieved for etching and deposition profiles enabling advanced manufacturing techniques for a variety of applications from electronic chip manufacturing to solar cell production. Modern trends have seen the advent of plasma medicine applications for cancer treatment and wound healing; micro-chemical reactors can convert waste products or ambient feedstocks into valuable chemicals, or energy storage media for clean energy and agricultural applications. Key to developing these applications for plasma control and understanding the underlying processes are advancing diagnostic and simulation techniques.

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