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Large Arrays of Microplasmas: Science, Applications, and the Road Ahead

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The science and technology of microcavity plasma devices has advanced rapidly over the past 5 years. Large arrays, comprising $> 10^5$ devices, have been realized and electron number densities as large as $> 10^{17}$ cm^{-3} have been generated reproducibly on a pulsed basis. This presentation will review briefly the characteristics of microplasmas generated within cavities as small as 10 μm. A view of future scientific opportunities will be offered and the recent discovery of a hybrid plasma/semiconductor device, based upon coupling of electron-hole and gas phase plasmas, will be reported.