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Abstract for an Invited Paper
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Plasma synthesis of silicon nanocrystal inks for low-cost photovoltaics[1]

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Silicon is the most widely used material in the microelectronics and photovoltaics industry. Currently it is used in one of two forms: as wafers of single- or polycrystalline material or as CVD deposited thin film material. In this presentation, we discuss an alternate route to forming silicon thin films from solution on flexible substrates. Silicon nanocrystals are formed in a nonthermal plasma. By adding dopant precursors, p- and n-doped as well as intrinsic crystals can be formed. Organic ligands can be attached in the plasma such that nanocrystals become soluble in organic solvents. These "nanocrystal inks" can be used to form silicon films with ultra-low-cost printing or coating techniques. Film properties of silicon-ink processed films will be discussed. Proof-of-concept demonstrations of solar cells produced from silicon inks will be presented.

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