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Recent Advances in Plasma Accelerators CHAN JOSHI, UCLA — In this talk I will review the recent progress on the production, manipulation, transport, acceleration, and focusing of relativistic electron beams using plasma techniques. In particular, I will report recent progress on cathode-less electron injectors, plasma accelerating and transport structures, and electron and positron beam focusing using plasmas. The plasma structures for acceleration can be excited either by laser beams or charged-particle beams. The acceleration gradients in either case can be enormous. For unmatched beams the betatron radiation loss, as the beam oscillates transversely in the high gradient accelerating structure, can generate a high brightness x-ray beam. These x-rays can, in turn, be used to generate positrons. I will describe recent work on the Laser Wakefield Accelerator that has produced the first quasi-monoenergetic beams from plasma accelerators. Work on beam-driven Plasma Wakefield acceleration done by the UCLA, USC, SLAC collaboration that has yielded first greater than a GeV energy gain from a plasma structure will also be described. Work done by different groups around the world will be reviewed.

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