of etching the substrate when formed into a plasma, thereby forming a gaseous mixture, forming the gaseous mixture into a plasma, and exposing a surface of the substrate to the plasma, wherein the surface is etched and a layer is deposited on at least a portion of the etched surface substantially simultaneously, thereby forming a nanostructure.

Further, when the substrate is a fluoropolymer, the above techniques provide exceptional adhesion to adjacent layers that may be applied by coating, laminating, or compression onto the nanostructure. Thus, in ~~another aspect~~some embodiments, the disclosure provides that where the substrate is a fluoropolymer, the method may further comprise contacting the nanostructure with a film or a film-forming material so as to form a multi-layered laminate. Fluoropolymers are notoriously difficult to make adhesion to, and with the techniques of this disclosure, it is possible to form a multilayered laminate where the adhesive strength between the film and the nanostructure is greater than the cohesive strength of the film.

In another aspect, the disclosure provides a method of forming a multilayered laminate, comprising:
providing a fluoropolymer film having at least a first surface, forming a nanostructure on a the first surface, and contacting the nanostructure with a film or a film-forming material so as to form a multi-layered laminate.

In some exemplary embodiments of the foregoing, the substrate can be a non-conductive substrate, for example a substrate including a (co)polymer (e.g. a (co)polymeric film), a fiber, a glass, a composite, a microporous membrane and combinations thereof. In certain such exemplary embodiments, the substrate can be transparent to visible light and can include (co)polymers such as poly(methyl methacrylate), poly(ethylene terephthalate), polycarbonate, cellulose, triacetate, polyamide, polyimide, a fluoropolymer, a polyolefin, a siloxane (co)polymer, a cyclic olefin (co)polymer, a polyurethane and combinations thereof.

In certain such exemplary embodiments, the first gaseous species includes a compound selected from the group consisting of organosilicon compounds, metal alkyl compounds, metal isopropoxide compounds, metal oxide compounds, metal acetylacetonate compounds, metal halide compounds, and combinations thereof. The second gaseous species can be, in some such exemplary embodiments, oxygen, a fluorocarbon, nitrogen trifluoride, sulfur hexafluoride, chlorine, hydrochloric acid,

methane, and combinations thereof. In some exemplary embodiments, an inert carrier gas, such as argon, can typically be mixed in with the second gaseous species.

In some particular exemplary embodiments of any of the foregoing, the nanostructure can have a dimension of less than about 400 nanometers (nm). In certain such exemplary embodiments, the nanostructure can have a dimension of less than about