20. Fringe generating optics for a spectrometer which create interference fringes from light from an object and which is adapted to transmit the interference fringes to a camera, comprising, in combination:

a housing;

front optics positioned in the housing comprising a diffuser adapted to receive light from the object; and

birefringent optics fixed with respect to the diffuser, positioned in the housing and which receive light from the diffuser and form orthogonal polarization components of the light;

wherein the fringe generating optics create interference fringes and the orthogonal polarization components have a phase difference which varies with an angle of incidence of the light received by the birefringent optics.

21. The~~A~~ spectrometer of claim 1~~for measuring a spectral signature of an object comprising, in combination:~~

~~front optics comprising a diffuser adapted to receive light from the object;~~

~~birefringent optics fixed with respect to the diffuser, adapted to receive light from the diffuser and to generate interference fringes, comprising a first birefringent flat plate and a second birefringent flat plate parallel to the first birefringent flat plate,~~ wherein the diffuser is positioned between the object and the birefringent optics~~;~~

~~a camera adapted to receive the interference fringes; and~~

~~a processor adapted to generate the spectral signature of the object~~.

22. ~~A~~The spectrometer of claim 1~~for measuring a spectral signature of an object comprising, in combination:~~

~~front optics comprising a diffuser adapted to receive light from the object;~~

~~birefringent optics fixed with respect to the diffuser, adapted to receive light from the diffuser and to generate interference fringes,~~ wherein the diffuser is in direct contact with the birefringent optics~~;~~

~~a camera adapted to receive the interference fringes; and~~

~~a processor adapted to generate the spectral signature of the object~~.

23. ~~.A~~The spectrometer of claim 1 wherein the front optics further ~~for measuring a spectral signature of an object comprising, in combination:~~

~~front optics comprising a diffuser adapted to receive light from the object;~~

~~birefringent optics fixed with respect to the diffuser, adapted to receive light from the diffuser and to generate interference fringes,~~ comprise~~ing~~ a first polariser and a second polariser, and ~~wherein~~ the first polarizer is positioned between the diffuser and the second polariser~~;~~

~~a camera adapted to receive the interference fringes; and~~

~~a processor adapted to generate the spectral signature of the object~~.