Display Design Suitable for Projection Displays with an Increased Color Gamut

Advantages
- Very large color gamut
- Suitable for projection displays, LCDs or other spatial light modulators
- Compatible with battery voltage for mobile operation

Invention
Methods and systems for a large color gamut display suitable for projection displays based on up converters and GaAs based semiconductor light sources.

Background
UCF researchers have developed a novel large color gamut display using up-converters in combination with semiconductor light sources and properly designed beam splitters. Prior art in this field utilize up-converters to make visible light, but fail to separate out the additional unwanted emissions generated by the source. As a result colors are not purely red, green or blue. The present invention enables that separation to produce only the desired light to be delivered by the display to the projection optics. Removal of unwanted color wavelengths from the up converter emission is achieved through the use of properly designed thin film coatings on beam combining optical components. This novel system is suitable for projection displays and can be used with up converter semiconductor light source array emissive screens. Moreover, it can also be used with Liquid Crystal Displays (LCDs) or other spatial light modulators where the up-converter-semiconductor light sources would serve as sources to illuminate the non-emissive spatial light modulator.

Application
This novel invention can be applied to front and rear projection displays, portable projection displays, or head mounted displays.

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