

## CLAIMS:

1. A light-emitting device having a pixel comprising:
  - a first non-tuneable sub-pixel configured to emit light at a first non-tuneable
  - 5 wavelength; and
  - a tuneable sub-pixel configured to emit light at a tuneable wavelength,
  - wherein the tuneable sub-pixel comprises:
    - a primary light-emitting material configured to emit light at a primary
    - wavelength in response to a primary electrical input; and
    - 10 a tuning element configured to modify the primary wavelength to a
    - secondary wavelength, wherein the secondary wavelength is tuneable, in
    - response to a secondary electrical input.
2. The light-emitting device of claim 1, wherein the primary light-emitting material
- 15 comprises quantum dots.
3. The light-emitting device of claim 2, wherein the tuning element comprises a
- piezoelectric actuator that applies stress to the primary light-emitting material to strain
- the quantum dots.
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4. The light-emitting device of claim 3 wherein the secondary wavelength is a function of
- strain, and a target wavelength for the secondary wavelength corresponds to an
- applied stress value.
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5. The light-emitting device of claim 4 further comprising a controller configured to
- determine whether the secondary wavelength is equal to the target wavelength
- corresponding to the applied stress value, and in the event that the secondary
- wavelength is not equal to the target wavelength to modify the stress applied to the
- semiconductor material until the secondary wavelength is equal to the target
- 30 wavelength.
6. The light-emitting device of any of claims 3 to 5 wherein the tuneable sub-pixel further
- comprises a light emitter that emits light at a light emitter wavelength.

7. The light-emitting device of claim 6 wherein the quantum dots are further configured to modify the light emitted at the light emitter wavelength such that the light emitted by the quantum dots is at the primary wavelength.
- 5 8. The light-emitting device of claim 7 wherein the secondary wavelength is a function of strain, and a target wavelength for the secondary wavelength corresponds to an applied stress value.
9. The light-emitting device of claim 2 wherein the tuneable sub-pixel further comprises  
10 a secondary light-emitting material comprising quantum dots, wherein the secondary light-emitting material is configured to convert light at the primary wavelength to light at a tertiary wavelength and to emit light at the tertiary wavelength in response to a tertiary electrical input.
- 15 10. The light-emitting device of claim 9 wherein the tuneable sub-pixel further comprises a tertiary light-emitting material comprising quantum dots, wherein the tertiary light-emitting material is configured to convert light at the tertiary wavelength to light at a quaternary wavelength and to emit light at the quaternary wavelength in response to a quaternary electrical input.
- 20 11. The light-emitting device of claims 9 and 10 wherein the primary, secondary and tertiary light-emitting materials emit light in an event that an applied electric current is above a threshold and transmit light in an event that an applied electric current is below a threshold.
- 25 12. The light-emitting device of claim 11 wherein the secondary electrical input is a combination of one or more of the primary, tertiary and quaternary electrical inputs.
13. The light-emitting device of claim 12 wherein the secondary wavelength is a function  
30 of the primary, tertiary and quaternary wavelengths.
14. The light-emitting device of any of claims 9 to 13 wherein the tuneable sub-pixel further comprises a light emitter that emits light at a light emitter wavelength and wherein the primary light-emitting material is further configured to modify the light

emitted at the light emitter wavelength such that the light emitted by the primary light-emitting material is at the primary wavelength.

15. The light-emitting device of claim 1 wherein the primary light emitting material  
5 comprises a light emitting molecule configured to emit light at wavelengths tuneable between the primary wavelength and the secondary wavelength by applying an electric field via the secondary electrical input so as to influence molecular topology of the light emitting molecule.
- 10 16. The light-emitting device of claim 15 further comprising a secondary light-emitting material comprising a light-emitting molecule configured to convert light at the primary wavelength to light at a tertiary wavelength and to emit light at the tertiary wavelength in response to a tertiary electrical input.
- 15 17. The light-emitting device of claim 16 further comprising a tertiary light-emitting material comprising a light-emitting molecule configured to convert light at the tertiary wavelength to light at a quaternary wavelength and to emit light at the quaternary wavelength in response to a quaternary electrical input.
- 20 18. The light-emitting device of claims 16 to 17 wherein the primary, secondary and tertiary light-emitting materials emit light in an event that an applied electric current is within a range and transmit light in an event that an applied electric current is outside the range.
- 25 19. The light-emitting device of any of claims 15 to 18 wherein the tuneable sub-pixel further comprises a light emitter that emits light at a light emitter wavelength and wherein the primary light-emitting material is further configured to modify the light emitted at the light emitter wavelength such that the light emitted by the primary light-emitting material is at the primary wavelength.  
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20. The light-emitting device of any preceding claim wherein one or more of the primary, secondary or tertiary light-emitting material is dissolved in a host material.
21. The light-emitting device of any preceding claim wherein one or more of the primary,  
35 secondary and tertiary light-emitting material is nanopatterned.

22. The light-emitting device of any preceding claim wherein the pixel has a second non-tuneable sub-pixel configured to emit light at a second non-tuneable wavelength and a third non-tuneable sub-pixel configured to emit light at a third non-tuneable wavelength.
23. The light-emitting device of claim 22 wherein the first, second and third non-tuneable sub-pixels each emit one of red, green and blue light.
24. The light-emitting device of any preceding claim, further comprising a controller configured to modify the secondary electrical input.
25. The light-emitting device of claim 24, wherein the controller is further configured to modify the secondary electrical input in response to an input.