CLAIMS

1 A device comprising:

a detector surface configured for supporting biological or chemical samples;

a sensor array comprising light sensors and light guides;

wherein the light guides receive excitation light and emissions signal light from the detector surface, wherein the light guides extend toward respective light sensors of the sensor array and comprise filter material, and wherein the filter material comprises a metal complex dye comprising a photon emission quencher.

2. A device comprising:

a structure defining a detector surface configured for supporting biological or chemical samples;

a sensor array comprising light sensors and circuitry to transmit signals using photons detected by the light sensors; and

a guide array comprising light guides;

wherein light guides of the guide array receive excitation light and emissions signal light from the detector surface, wherein the light guides extend toward respective light sensors of the sensor array and comprise filter material that blocks the excitation light and permits the emissions signal light to propagate toward the respective light sensors, and wherein the filter material comprises a metal complex dye comprising a photon emission quencher.

3. The device of claim 1 or 2, wherein the filter material comprises metal complex dye suspended in a polymer binder matrix.

4. The device of claim 1 or 2, wherein the filter material comprises a homogeneous matrix of metal complex dye and a polymer binder and wherein the homogeneous matrix comprises a weight concentration ratio of metal complex dye to polymer binder in the range of from about 70:30 to about 90:10.

5. The device of claim 1 or 2, wherein the detector surface includes a reaction recess for supporting a sample, wherein the reaction recess

comprises an index of refraction and dimension to cancel background radiation in a detection band of the sensor array.

6. The device of claim 1 or 2, wherein the metal complex dye comprises a transition metal complex dye.

7. The device of claim 1 or 2, wherein the metal complex dye comprises a transition metal and a dye and wherein the transition metal has an absorption spectral profile overlapping a fluorescence emissions spectral profile of the dye.

8. The device of claim 1 or 2, wherein the metal complex dye reduces an auto-fluorescence of the filter material.

9. The device of claim 1 or 2, wherein the filter material comprises a counter ion associated to the metal complex dye.

10. The device of claim 9, wherein the counter ion comprises an alkyl amine.

11. The device of claim 10, wherein the alkyl amine comprises at least one hydrocarbon group of at least four carbon atoms.

12 A method comprising:

depositing filter material within guide cavities of a guide cavity array that are aligned with and disposed above respective light sensors of a light sensor array, wherein the filter material comprises a metal complex dye comprising a photon emission quencher; and

fabricating a structure defining a detector surface for supporting biological or chemical samples above cavities of the guide cavity array and light sensors of the light sensor array.

13. A method comprising:

fabricating circuitry to transmit data signals using photons detected by a light sensor array;

depositing filter material within guide cavities of a guide cavity array that are aligned with and disposed above respective light sensors of the light sensor array, wherein the filter material comprises a metal complex dye suspended in a polymer matrix, the metal complex dye comprising a photon emission quencher; and

fabricating a structure defining a detector surface for supporting biological or chemical samples, wherein the fabricating the structure defining the detector surface includes fabricating the structure defining the detector surface above cavities of the guide cavity array and light sensors of the light sensor array.

14. The method of claim 12 or 13, wherein the depositing filter material comprises using chemical vapor deposition, and wherein subsequent to the depositing, the deposited filter material is subject to processing using one or more of etching and planarizing.

15. The method of claim 12 or 13, wherein the fabricating circuitry includes using complementary metal oxide semiconductor CMOS fabrication technology.

16. The method of claim 12 or 13, wherein the filter material comprises a homogeneous matrix of metal complex dye and polymer binder.

17. The method of claim 12 or 13, wherein the filter material comprises a matrix of metal complex dye and polymer binder and wherein a weight concentration of metal complex dye to polymer binder is in the range of from about 70:30 to about 90:10.

18. The method of claim 12 or 13, wherein the fabricating a structure defining the detector surface comprises forming a reaction recess defined in the detector surface, wherein the forming includes configuring the reaction recess so that based on an index of refraction of the detector surface and a dimensional characteristic of the reaction recess, an induced electromagnetic field radiating from the detector surface cancels background light energy incident on the detector surface in a detection wavelength band of the light sensor array.

19. The method of claim 12 or 13, wherein the method includes subjecting one or more test sample detectors to testing to determine information relating a dimension of a detector surface to an electromagnetic field cancellation effect and wherein the fabricating the structure defining a detector surface includes dimensioning, using the determined information, a reaction recess of the detector surface to cancel light energy incident on the detector surface in a detection band of the light sensor array.

20. The method of claim 12 or 13, wherein the filter material comprises a counter ion associated to a metal complex dye comprising the dye.

21. The method of claim 20, wherein the counter ion comprises an alkyl amine.

22. The method of claim 21, wherein the alkyl amine comprises at least one hydrocarbon group of at least four carbon atoms.

23 A device comprising:

a detector surface for supporting biological or chemical samples;

a sensor array comprising light sensors; and

light guides;

wherein light guides receive excitation light and emissions signal light from the detector surface, wherein the light guides extend toward respective light sensors of the sensor array, wherein the detector surface includes a reaction recess, the reaction recess comprising an index of refraction and a dimension sufficient to cancel background light energy incident on the detector surface in a detection band of the sensor array.

24. A device comprising:

a structure defining a detector surface for supporting biological or chemical samples;

a sensor array comprising light sensors, and circuitry to transmit data signals based on photons detected by the light sensors; and

a guide array comprising light guides;

wherein light guides of the guide array receive excitation light and emissions signal light from the detector surface, wherein the light guides

extend toward respective light sensors of the sensor array and comprise filter material that blocks the excitation light and permits the emissions signal light to propagate toward the respective light sensors, wherein the detector surface includes a reaction recess, the reaction recess comprising an index of refraction and a dimension sufficient to cancel background light energy incident on the detector surface in a detection band of the sensor array.

25. The device of claim 23 or 24, wherein the reaction recess comprises an index of refraction and a dimension sufficient to transmit a center wavelength of the excitation light.

26. The device of claim 23 or 24, wherein the reaction recess comprises an index of refraction and a dimension sufficient to establish a critical wavelength λc so that λc is within a range of wavelengths of between about λa and about λb, wherein wavelengths shorter than λc are transmitted by the reaction recess and wherein wavelengths longer than λc are cancelled by the reaction recess, wherein λa is the center wavelength of excitation light and wherein λb is the shortest detection band wavelength of the sensor array.

27. The device of claim 24, wherein the filter material comprises a matrix of metal complex dye and a polymer binder and wherein a weight concentration of metal complex dye to polymer binder in the matrix is in the range of from about 70:30 to about 90:10.

28. The device of claim 24, wherein the filter material comprises a metal complex dye that comprises a transition metal complex dye.