Claims

1. A cell arrangement comprising:

a plurality of solar sub cells stacked above one another;

wherein at least one solar sub cell of the plurality of solar sub cells comprises an alloy of gallium, nitrogen, arsenic and antimony; and

wherein the alloy has a formula $GaN_xAs_{1-x-y}Sb_y$.

~~2. The cell arrangement according to claim 1,~~

~~wherein the alloy has a formula $GaN_xAs_{1-x-y}Sb_y$.~~

~~3.~~2. The cell arrangement according to claim 1 ~~or claim 2~~,

wherein the alloy has an energy band gap ranging from about 0.6 eV to about 1.4 eV.

~~4.~~3. The cell arrangement according to ~~any of claim 1 to 3~~claim 1 or claim 2,

wherein the plurality of solar sub cells are separated from one another by a tunnel junction layer.

~~5.~~4. The cell arrangement according to claim ~~2~~1,

wherein $0.01 \leq x \leq 0.04$.

~~6.~~5. The cell arrangement according to claim ~~2~~1,

wherein $0.04 \leq y \leq 0.15$.

~~7.~~6. The cell arrangement according to any of claims 1 to ~~6~~5,

wherein at least one of the solar sub cells comprises a plurality of layers.

~~8.~~7. The cell arrangement according to any of claims 1 to ~~7~~6,

wherein a first solar sub cell is arranged at the top surface of the cell arrangement;

and;

wherein the at least one solar sub cell comprising the alloy of gallium, nitrogen, arsenic and antimony is arranged below the first solar sub cell so that light is received by the first solar sub cell and a portion of the light passing through the first solar sub cell is received by the at least one solar sub cell comprising the alloy of gallium, nitrogen, arsenic and antimony.

~~9.~~8. The cell arrangement according claim ~~8~~7,

wherein the first solar sub cell comprises any one of aluminum gallium indium phosphide or gallium indium phosphide.

~~10.~~9. The cell arrangement according to any of claims 1 to ~~9~~8, further comprising:

a solar sub cell comprising gallium arsenide adjacent to the at least one solar sub cell comprising the alloy of gallium, nitrogen, arsenic and antimony.

~~11.~~10. The cell arrangement according to any of claims 1 to ~~10~~9 further comprising:

a solar sub cell comprising indium gallium arsenide adjacent to the at least one solar sub cell comprising the alloy of gallium, nitrogen, arsenic and antimony.

~~12.~~11. The cell arrangement according to any of claims 1 to ~~11~~10,

wherein a second solar sub cell is arranged at the bottom of the cell arrangement; and

wherein the at least one solar sub cell comprising the alloy of gallium, nitrogen, arsenic and antimony is arranged above the second solar sub cell so that light is received by the at least one solar sub cell comprising the alloy of gallium, nitrogen, arsenic and antimony and a portion of the light passing through the at least one solar sub cell comprising the alloy of gallium, nitrogen, arsenic and antimony is received by the second solar sub cell.

~~13.~~12. The cell arrangement according to any of claims 1 to ~~12~~11 further

comprising:

a solar sub cell comprising germanium adjacent to the at least one solar sub cell comprising the alloy of gallium, nitrogen, arsenic and antimony.

~~14.~~13. The cell arrangement according to any of claims 1 to ~~13~~12,

wherein each sub cell further comprises a back surface field layer.

~~15.~~14. The cell arrangement according to any of claims 1 to ~~14~~13,

wherein each sub cell further comprises a desorption blocker layer.

~~16.~~15. The cell arrangement according to any of claims 1 to ~~15~~14,

wherein each sub cell further comprises a front surface field layer.

~~17.~~16. The cell arrangement according to any of claims 1 to ~~16~~15,

wherein the at least one solar sub cell of the plurality of solar sub cells comprising the alloy of gallium, nitrogen, arsenic and antimony comprises:

a first layer of the alloy of gallium, nitrogen, arsenic and antimony; and a second layer on the first layer.

~~18.~~17. The cell arrangement according to claim ~~17~~16,

wherein the second layer comprises gallium arsenide.

~~19.~~18. The cell arrangement according to claim ~~17~~16 or ~~18~~17,

wherein the first layer is doped with dopants of a first conductivity type and the second layer is doped with dopants with a second conductivity type.

~~20.~~19. The cell arrangement according to any of claims 1 to ~~19~~18,

wherein the cell arrangement is on a substrate.

~~21.~~20. The cell arrangement according to claim ~~20~~19,

wherein layers making up each solar sub-cell are matched in a substantially unstrained lattice to the substrate.

~~22.~~21. The cell arrangement according to claim ~~20~~19 or ~~21~~20,

wherein the substrate comprises of a semiconductor material.

~~23.~~22. The cell arrangement according to claim ~~22~~21,

wherein the semiconductor material is gallium arsenide.

~~24.~~23. The cell arrangement according to any of claims ~~20~~19 to ~~23~~22,

wherein a solar sub cell nearer to the substrate is configured to absorb photons having a lower energy for converting into electrical energy than a solar sub cell further from the substrate.

~~25.~~24. The cell arrangement according to any of claims ~~20~~19 to ~~23~~22,

wherein a solar sub cell further from the substrate is configured to absorb photons having a lower energy for converting into electrical energy than a solar sub cell nearer from the substrate.

~~26. A method of fabricating a cell arrangement, the method comprising:~~

~~stacking a plurality of solar sub-cells above one another;~~

~~wherein at least one solar sub-cell of the plurality of solar sub-cells comprises an alloy of gallium, nitrogen, arsenic and antimony.~~