CLAIMS

1. A head-on photomultiplier tube (PMT), comprising:

a housing having a top end with a window, two lateral sides, and a bottom end;

an array of reflective photocathodes within the housing, each of the reflective photocathodes for receiving light entering the housing through the window of the top end of the housing, and for generating photoelectrons from the received light; and

at least one dynode structure within the housing and corresponding to the array of reflective photocathodes for multiplying the photoelectrons generated by the corresponding array of reflective photocathodes.

2. The head-on PMT of claim **1**, wherein the housing is a tube.

3. The head-on PMT of claim **1**, wherein each of the reflective photocathodes is positioned at a diagonal angle from the top end of the housing.

4. The head-on PMT of claim **1**, wherein each of the at least one dynode structure includes a plurality of dynodes.

5. The head-on PMT of claim **4**, wherein the dynodes are positioned in a chain for passing the photoelectrons therebetween.

6. The head-on PMT of claim **4**, wherein each of the dynodes multiplies photoelectrons received thereby.

7. The head-on PMT of claim **1**, wherein the at least one dynode structure includes a single dynode structure that correspond to multiple of the reflective photocathodes in the array.

8. The head-on PMT of claim **7**, wherein the single dynode structure corresponds to all of the reflective photocathodes in the array.

9. The head-on PMT of claim **1**, wherein the at least one dynode structure includes a separate dynode structure corresponding each of the reflective photocathodes in the array.

10. The head-on PMT of claim **1**, wherein the light is one of:

incident to the array of reflective photocathodes at an angle, and

perpendicularly incident to the array of reflective photocathodes.

11. The head-on PMT of claim **10**, wherein:

when the light is incident to the array of reflective photocathodes at the angle then each of the reflective photocathodes is situated at a first angle, and

when the light is perpendicularly incident to the array of reflective photocathodes then each of the reflective photocathodes is situated at a second angle that is different from the first angle.

12. A method for manufacturing a head-on photomultiplier tube (PMT), comprising:

configuring, within a housing having a top end with a window, two lateral sides, and a bottom end, an array of reflective photocathodes, each of the reflective photocathodes being at a position capable of receiving light entering the housing through the window of the top end of the housing; and

providing, within the housing, at least one dynode structure corresponding to the array of reflective photocathodes, the at least one dynode structure being at a position capable of receiving photoelectrons when gen-

erated by the corresponding array of reflective photocathodes from the received light.

13. The method of claim **12**, wherein the housing is a tube.

14. The method of claim **12**, wherein each of the reflective photocathodes is positioned at a diagonal angle from top end of the housing.

15. The method of claim **12**, wherein each of the dynode structures includes a plurality of dynodes.

16. The method of claim **15**, wherein the dynodes are positioned in a chain for passing the photoelectrons therebetween.

17. The method of claim **15**, wherein each of the dynodes multiples photoelectrons received thereby.

18. The method of claim **12**, wherein the light is one of:

incident to the array of reflective photocathodes at an angle, and

perpendicularly incident to the array of reflective photocathodes.

19. The method of claim **18**, wherein:

when the light is incident to the array of reflective photocathodes at the angle then each of the reflective photocathodes is situated at a first angle, and

when the light is perpendicularly incident to the array of reflective photocathodes then each of the reflective photocathodes is situated is situated at a second angle that is different from the first angle.

20. The method of claim **12**, wherein the at least one dynode structure includes a single dynode structure that correspond to multiple of the reflective photocathodes in the array.

21. The method of claim **10**, wherein the single dynode structure corresponds to all of the reflective photocathodes in the array.

22. The method of claim **12**, wherein the at least one dynode structure includes a separate dynode structure corresponding each of the reflective photocathodes in the array.