CLAIMS

What is claimed is:

1. An image sensor pixel, comprising:

a substrate;

a photoelectric conversion unit supported by said substrate;

a sealing film transparent to visible lights, air being above said sealing film, light rays entering from above said sealing film impinging on said photoelectric conversion unit;

a color filter wholly under said sealing film;

an air gap containing air or a gas, said air gap being on a lateral side of said color filter and under said sealing film;

a light guide below said color filter, a plurality of light rays entering said light guide from above said sealing film crossing only flat interfaces.

2. The pixel of claim 1, wherein a surface of said sealing film is concave, said air gap being under said surface.

3. The pixel of claim 2, wherein said surface diverges light rays into said color filter, said light rays entering said air gap from said sealing film.

4. An image sensor chip, comprising:

a cover glass;

a transparent film under said cover glass; and

an image sensor dice under said transparent film, said image sensor dice comprising a plurality of image sensor pixels on a substrate, each of said image sensor pixels comprising:

a photoelectric conversion unit supported by said substrate;

a color filter wholly under said transparent film;

an air gap containing air or a gas, said air gap being on a lateral side of said color filter and under said transparent film; and

a light guide below said color filter, a plurality of light rays entering said light guide from above said cover glass crossing only flat interfaces.

5. The pixel of claim 4, wherein a surface of said transparent film is concave, said air gap being under said surface.

6. The pixel of claim 5, wherein said surface diverges light rays into said color filter, said light rays entering said air gap from said transparent film.

7. A method for fabricating a pixel of an image sensor, comprising:

forming a support film with an opening and over a substrate that supports a photoelectric conversion unit; and,

forming a color filter in the opening of the support film;

removing from above a portion of said support film adjacent to a lateral side of said color filter to form an air gap adjacent the lateral side; and

forming a sealing film on the color filter and the air gap by a dynamic spin coating, the sealing film sealing air or a gas in the air gap from above.

8. The method of claim 7, further comprising forming a concave surface on the sealing film, the air gap under the concave surface.